



Defense

AT&L

Acquisition, Technology and Logistics

A PUBLICATION OF THE DEFENSE ACQUISITION UNIVERSITY

Better Buying Power

A Progress Assessment
from the Defense
Acquisition Executive

by the Under Secretary
of Defense for Acquisition,
Technology and Logistics

Soaring With AC-130J

A Decidedly Nontraditional
Acquisition Strategy

Creative Problem Solving

in a Fast-Paced,
Guidance-Rich Environment

Prototyping

Increasing the
Pace of Innovation



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Defense AT&L

Vol XLIII

No. 4, DAU 239

Published by the
DEFENSE ACQUISITION UNIVERSITY

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Defense AT&L (ISSN 1547-5476), formerly *Program Manager*, is published bimonthly by the DAU Press and is free to all U.S. and foreign national subscribers. Periodical postage is paid at the U.S. Postal Facility, Fort Belvoir, Va., and additional U.S. postal facilities.

POSTMASTER, send address changes to:

DEFENSE AT&L
DEFENSE ACQUISITION UNIVERSITY
ATTN DAU PRESS STE 3
9820 BELVOIR ROAD
FT BELVOIR VA 22060-5565

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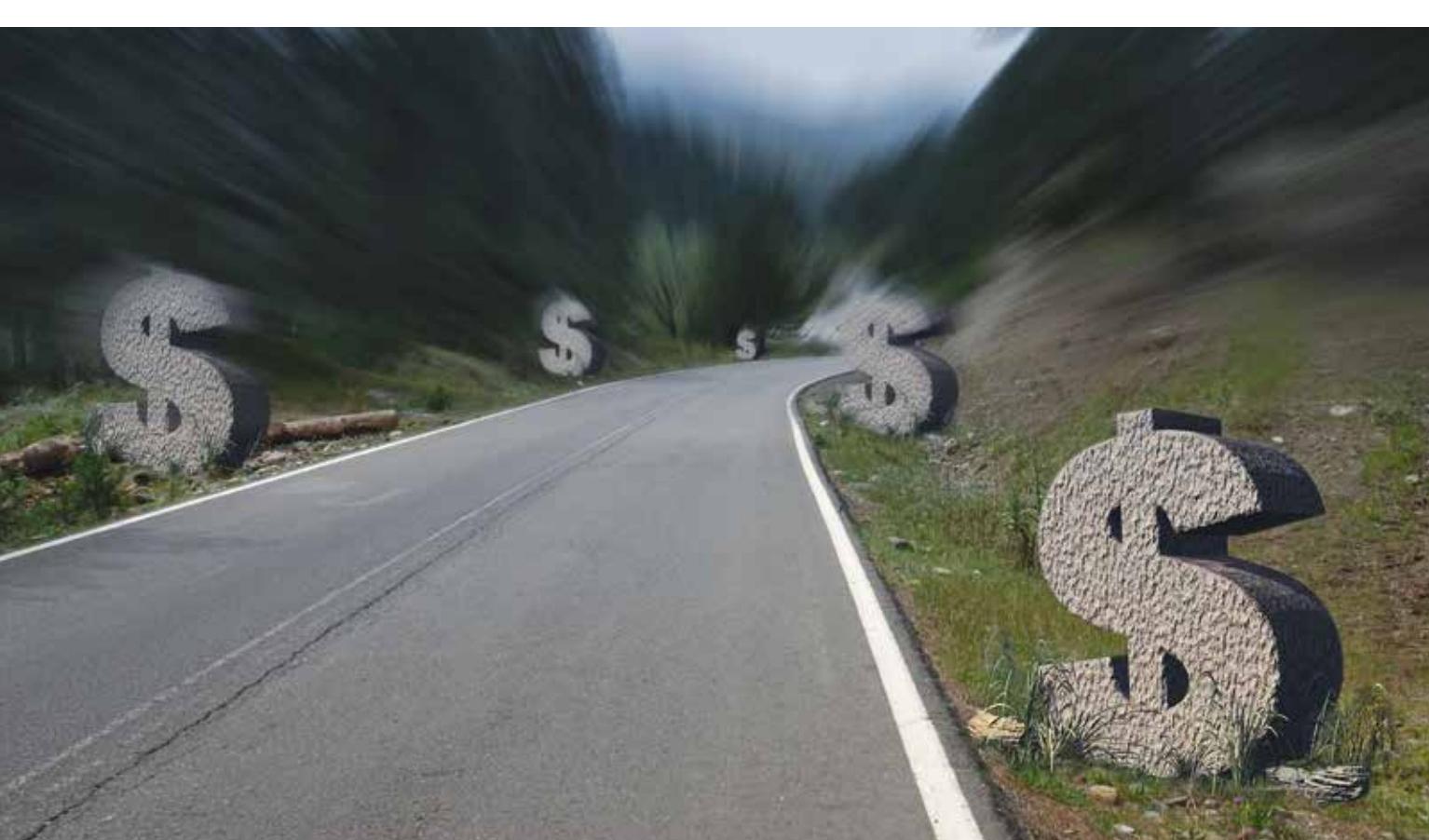
Better Buying Power

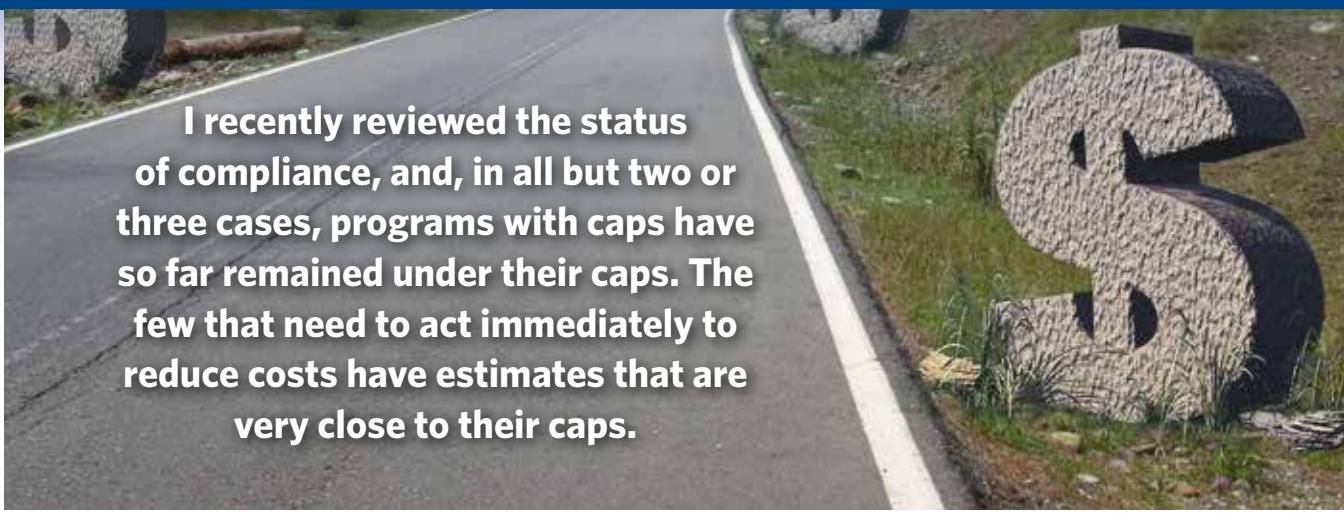
A Progress Assessment from the Defense Acquisition Executive

Frank Kendall

We are now four years since Dr. Carter and I began work on the first iteration of Better Buying Power, the label Dr. Carter gave to the original set of policies we promulgated as part of then Secretary Gates' efficiency initiatives in 2010. In the intervening years, I've released the second iteration, or BBP 2.0 as it's called, and I've also recently made some statements in public that BBP 3.0 may be on the horizon. Has all this made a difference? I believe it has, although I'm also certain that we have ample room for

additional gains in productivity and other improved outcomes. Despite some comments I've made about BBP 3.0, the commitment to the enduring practices and policies from both the original BBP and BBP 2.0 remains. The whole concept of Better Buying Power is of a commitment to continuous incremental improvement; improvement based on experience, pragmatism and analysis of the evidence (i.e., the data). Four years on, as we begin to consider the next steps we may decide to take, it's a reasonable time to take a look at what we have done so far.





I recently reviewed the status of compliance, and, in all but two or three cases, programs with caps have so far remained under their caps. The few that need to act immediately to reduce costs have estimates that are very close to their caps.

When I introduced the second iteration of Better Buying Power, we had already made a number of adjustments (continuous evolutionary improvements) to the initiatives in the first iteration. Under 2.0, most of the BBP 1.0 initiatives continued, either under the 2.0 label or just as good best practices we may not have emphasized under BBP 2.0. Where changes were made, this was clearly articulated in 2.0. For example, the overly restrictive guidance on fixed-price incentive contract type (never intended to be as prescriptive as it may have been interpreted to be) was changed to emphasize sound decision making about the best contract type to use in a given circumstance. We also relaxed the model constraints on time to recompete service contracts that proved too restrictive.

In general, BBP 2.0 moved us in an incremental way from the set of model rules or best practices that tended to characterize BBP 1.0, to a recognition that, in the complex world of defense acquisition, critical thinking by well informed and experienced acquisition professionals is the key to success—not one-size-fits-all rules. This is equally true of the acquisition of contracted services for maintenance, facility support, information technology, or anything else we acquire from industry, as it is for the various aspects of the large programs that we normally associate with defense acquisition.

I won't cover every initiative in BBP 2.0, but in general here's where I think we are in improving defense acquisition, and where I think we still need to go on these initiatives.

Achieving Affordable Programs

Over the past four years we have continuously increased the number of major programs with assigned affordability targets (Milestone A or before) or caps (Milestone B) as programs come through the milestone review process. I recently reviewed the status of compliance, and, in all but two or three cases, programs with caps have so far remained under their caps. The few that need to act immediately to reduce costs have estimates that are very close to their caps. I believe we

have been successful in applying the caps. The affordability analysis process is also detailed in the new Department of Defense Instruction (DoDI) 5000.02, and in most cases this process is being followed by service programming communities who do the long-term budget analysis needed to derive caps on sustainment and production. For smaller programs that are a fraction of the considered capability portfolio, assigning a cap can be problematic, but it still needs to be done to instill discipline in the requirements process. Looking forward, the Department has a significant problem in the next decade affording certain portfolios—strategic deterrence, shipbuilding and tactical aircraft are examples. This situation will have to be addressed in the budget process, but I think we can say that we are making reasonable progress in the acquisition system in constraining program cost, especially for unit production cost, which is easier to control than sustainment. Nevertheless, we have challenges particularly in understanding long-term affordability caps outside the five-year planning cycle, especially under a sequestration level budget scenario.

Controlling Cost Throughout the Acquisition Life Cycle

The implementation of "should-cost based management" is well under way, but work is still needed to instill this concept deeply in our culture and the way we do business. "Should cost" challenges every DoD manager of contracted work to identify opportunities for cost reduction, to set targets to achieve those reductions, and to work to achieve them. Managers at all levels should be taking and requiring that these steps be taken and rewarding successful realization of cost savings. I am seeing more and more of the desired behavior as time passes, but I am also still seeing cases where implementation seems to be more token than real. We also have work to do in understanding and teaching our managers the craft of doing "should cost" for our smaller programs (e.g., Acquisition Category IIIs, Services, etc.)—this remains a work in progress. Overall, "should cost," as a single measure alone, if fully implemented, will cause fundamental change in

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how we manage our funds. The letter the Under Secretary of Defense (Comptroller) and I signed two years ago laying out our expectations for major program obligation rate reviews is still operative; the job is not to spend the budget, it is to control costs while acquiring the desired product or service and to return any excess funds for higher-priority needs. The chain of command still has to learn how to support that behavior instead of punishing it. For major program "should cost" realization, the saved funds will continue to remain with the Service or Agency, preferably for use in the program or portfolio that achieved the savings.

We are making progress at measuring and understanding the performance of the acquisition system. Last year I published

affordability caps and expanded use of Configuration Steering Boards or "provider forums" are also strengthening the linkage to the requirements communities. There is an ancient debate about which comes first, requirements or technology. The debate is silly; they must come together and it cannot be a one-time event in a program but continuous. Requirements that are not feasible or affordable are just so many words. A program that doesn't meet the user's needs is wasted money.

The BBP 2.0 program to increase the use of defense exportability features in initial designs is still in the pilot stage. I believe this concept is sound, but the implementation is difficult because of some of the constraints on our budgeting, appropriations and contracting systems. Support for U.S. defense



Strengthening discretionary research and development by industry was an early BBP initiative. I am concerned that industry is cutting back on internal research and development as defense budgets shrink.

the first edition of the Annual Report on the Performance of the Defense Acquisition System. The next report should be published at about the time that this article goes to press. Each year we will try to expand the data set with relevant information about all aspects of defense acquisition performance. We will also add analysis that will help us understand the root causes of good and poor results and that correlates the results we are seeing with our policies. We need to make decisions and track our performance via data and robust analysis, not anecdote or opinion. Further, it isn't always easy to look in the mirror, and some government institutions or industry firms may not like what the report reveals, but the road to improvement has to begin with an understanding of where the problems lie.

I believe we are also gaining ground with regard to cooperation between the requirements and acquisition communities. My own partnership with the Vice Chairman of the Joint Chiefs of Staff and the Joint Requirements Oversight Council is intended to set the example in this area. We meet frequently to discuss issues of mutual concern and to reinforce each other's roles in the requirements and acquisition systems. The use of

exports pays large dividends for national security (improved and closer relationships), operationally (built-in interoperability and ease of cooperative training), financially (reduced U.S. cost through higher production rates), and industrially (strengthening our base). This initiative will continue on a pilot basis, but hopefully be expanded as the implementation issues are identified and worked out.

Incentivize Productivity and Innovation in Industry and Government

Our analysis of the data shows that we have more work to do in aligning profitability with performance. This year's *Annual Report on the Performance of the Acquisition System* will provide the data. In most cases we get it right—good performance leads to higher profits, and poor performance leads to lower profits. In some cases, however, there is no discernable impact of performance on margins, and in a few cases profit actually moves in the opposite direction from performance. In addition to getting the correlation right, we also need to make the correlation stronger and to tie increased rewards to real accomplishments. We want win-win business deals, but we aren't always obtaining them.

In BBP 2.0, we modified the guidance from BBP 1.0 to focus attention on professional judgments about the appropriate contract type, as opposed to emphasizing one type over others. As we analyze the data on major programs, it shows that in general we get this right, particularly with regard to choices between fixed-price and cost-plus vehicles. We are still in the process of providing updated guidance in this area. One thing is clear from the data: Where fixed price is used, there is benefit to greater use of fixed-price incentive vehicles, especially in production contracts and even beyond the initial lots of production. We are increasing the use of fixed-price incentive contracts in early production—and it is paying off.

We have begun to monetize the value of performance above threshold levels, however this practice is still in its early phases of implementation. Requirements communities usually express a “threshold” level of performance and a higher “objective” level of performance, without any indication of how much in monetary terms they value the high level of capability. It represents a difficult culture change for our operational communities to have to put a monetary value on the higher than minimum performance levels they would prefer—if the price were right. The Air Force Combat Rescue Helicopter was the first application of this practice now in the process of being applied more widely across the Department. Forcing Service requirements and budget decision makers to address the value they place on higher performance (which has nothing to do with the cost) is leading to better “best value” competitions where industry is well informed about the Department’s willingness to pay for higher performance, innovation is encouraged and source selections can be more objective.

One of the strongest industry inputs we received in formulating the BBP 2.0 policies was that the “lowest price, technically acceptable” (known as LPTA) form of source selection was being misused and overused. We have provided revised policy guidance that, like other contracting techniques, LPTA should be used with professional judgment about its applicability. This technique works well when only minimal performance is desired and contracted services or products are objectively defined. LPTA does simplify source selection, but it also limits the government’s ability to acquire higher quality performance. I believe we have been successful in reducing the use of LPTA in cases where it isn’t appropriate, but we are open to continued feedback from industry on this.

Instituting a superior supplier incentive program that would recognize and reward the relative performance levels of our suppliers was a BBP 1.0 initiative that we have had great difficulty implementing. I’m happy to report that the Navy pilot program has completed the evaluation of the Navy’s top 25 contracted service and product suppliers. The evaluation used

the Contractor Performance Assessment Rating System (or CPARS) data as its basis. Major business units within corporations were assessed separately. The Navy is providing results divided into top, middle and lower thirds. Business units or firms in the top third will be invited to propose ways to reduce unneeded administrative and overhead burdens. The Superior Supplier Program will be expanded DoD-wide over the next year. We expect this program to provide a strong incentive to industry to improve performance and tangible benefits to our highest performing suppliers. Finally, we expect to build on this Navy pilot and expand it to the other Services.

BBP 2.0 encouraged the increased use of Performance Based Logistics (PBL) contract vehicles. These vehicles reward companies for providing higher levels of reliability and availability to our warfighters. If the business deal is well written and properly executed, then PBL does provide cost savings and better results. The data shows that we have not been able to expand the use of PBL for the last two years and that prior to that the use was declining. Declining budgets as well as the budget uncertainty itself, and therefore contract opportunities, are part of this story, as is the fact the PBL arrangements are harder to structure and enforce than more traditional approaches. Those factors, combined with the imposition of sequestration, furloughs and a government shutdown last year are likely to have suppressed the increased use of PBL. This area will receive additional management attention going forward; we are going to increase the use of this business approach.

Another major input to BBP 2.0 received from industry concerned the large audit backlog with the Defense Contract Audit Agency (DCAA). The backlogs both delay contract close-out payments and extend the time before new awards can occur. Pat Fitzgerald, the DCAA Director, has worked very closely with the acquisition community to address this. Pat is a regular participant in the monthly Business Senior Integration Group meetings that I chair to manage BBP implementation. Under Pat’s leadership, DCAA is well on the way to eliminating most of the incurred cost audit backlog and expects to effectively eliminate the areas with the most excessive backlog over the next year. This is being accomplished despite all the workforce issues the Department has been forced to deal with.

Strengthening discretionary research and development by industry was an early BBP initiative. I am concerned that industry is cutting back on internal research and development as defense budgets shrink. This is an area we have tried to strengthen under BBP. We have made good progress in providing an online forum for industry to understand the Department’s technology needs and internal investments, and for industry to provide research and development results to government customers. If company R&D isn’t being conducted,

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then these steps certainly can't substitute for doing the actual research. We will be tracking these investments carefully going forward, and I will be working with defense company chief executives and chief technology officers to review their investment plans. The wisest course for industry is to continue adequate investments in R&D so as to be positioned for the inevitable future increase in defense budgets. Now is the time for all of us to invest in research and development. This requires discipline and commitment to the long-term as opposed to short-term performance, however. Most of the chief executives I have discussed this with share this perspective; they recognize that the Department needs industry partners who are in this for the long term with the Department.

Eliminate Unproductive Processes and Bureaucracy

I would like to be able to report more success in this regard, but I am finding that bureaucratic tendencies tend to grow and to generate products for use within the bureaucracy itself, together with the fact that the comfortable habits of years and even decades are hard to break. This is all even truer, in my opinion, within the Services than it is within the Office of the Secretary of Defense (OSD). On the plus side, however, we are making progress and I have no intention of stopping this effort.

I have taken steps to reduce the frequency of reviews, particularly reviews at lower staff levels. Whenever possible we are combining OSD and Service reviews or using senior-level in-depth reviews without preceding staff reviews and briefings. I have also instituted an annual consideration of major programs for delegation to the Services for management. Where the program risk has been significantly mitigated and/or all major Department investment commitments have already been made, I am delegating programs for Service oversight. I am also looking for opportunities to conduct pilot "skunk works" type oversight of programs which will, among other features, substitute in-depth but short on-scene reviews for the numerous formal documents with attendant staffing process that are normally required to support milestone decisions. I have also set firm and short timespans for staff review of some key documents so that issues are identified quickly and elevated rather than debated endlessly at the staff level.

Our efforts to increase the role and primacy of the acquisition chain of command are also making progress, but have additional room for improvement. A full-day workshop the Service Acquisition Executives (SAEs) and I recently conducted with all the Department's Program Executive Officers (PEOs) was very effective in communicating our priorities and in obtaining feedback on Better Buying Power and other

initiatives. That feedback will be very helpful as we adjust our policies going forward. I also recently conducted a half-day workshop with our PEOs and program managers who manage and direct the Department's business systems. This is an area where I feel strongly that we can reduce some of the burdensome overhead and bureaucracy associated with these programs. I will need the support of the Congress to achieve this, however.

Time is money, and reducing cycle time, particularly long development times and extended inefficient production runs would improve the Department's productivity. I have reviewed the data on development timelines and they have increased, but not on average by outrageous amounts; the average increase in major program development time over the last few decades is about nine months. Much of this increase seems to be driven by longer testing cycles, brought on by the growth in the number of requirements that have to be verified, and by the increased complexity and size, and therefore development time, of the software components of our programs. We are still collecting data and analyzing root causes of cycle time trends, but the most debilitating one is obvious: Budget cuts in general and sequestration cuts in particular are forcing the Department to adopt low production rates, in some cases below the theoretical minimum sustaining rate. Lowering production rates is stretching out our production cycle time and raising unit costs almost across the board.

Promote Effective Competition

Competition works. It works better than anything else to reduce and control costs. Unfortunately, the current data shows that the Department is losing ground in the percentage of contracted work being let competitively each year. The erosion is not huge, and I believe that decreasing budgets, which limit new competitive opportunities, are a major root cause. The Air Force launch program provides an example; we were moving aggressively toward introducing competition when budget cuts forced the deferral of about half the launches scheduled for competition. This is an area that I will be tracking closely and managing with the SAEs and agency heads in the coming months to try to reverse the recent trend.

Under BBP, we have recognized that for defense programs, head-to-head competition isn't always viable, so we are emphasizing other steps or measures that can be taken to create and maintain what we call "competitive environments." Simply put, I want every defense contractor to be worried that a competitor may take his work for DoD away at some point in the future. As I review programs, I ask each program manager and PEO to identify the steps they are taking to ensure the existence of a competitive environment for the efforts they are leading.

Open systems provide one opportunity to maintain competition below the prime level and to create a competitive environment for any future modifications or upgrades. Open systems and government “breakout” of components or subsystems for direct purchase are not necessarily in the interest of our primes, so careful management of interfaces and associated intellectual property, especially technical data rights, is key to achieving competition below the prime level and for future upgrades. Industry has a right to a fair price for intellectual property it has developed, but the government has many inherent rights and can consider the intellectual property implications of offerings in source selection. Our principal effort in this area has been to educate and train our workforce about how to manage this complex area. This is an effort that will

work placed with small businesses, this has been done with the recognition that work allocated to small businesses will be provided through competition, and competition that involves firms without the overhead burdens of our large primes. At this time, the trends in our small business awards are positive, despite the difficulties of the last few years, and I have strong expectations for our performance this fiscal year.

The Department continues to emphasize competitive risk-reduction prototypes—when the business case supports it. This best practice isn’t called for in every program; the risk profile and cost determine the advisability of paying for competitive system-level prototypes. The available data shows that when we do acquire competitive risk-reduction prototypes



This best practice isn't called for in every program; the risk profile and cost determine the advisability of paying for competitive system-level prototypes.

bear fruit over time and in which I believe reasonable progress is being made. As we mature our practice in this area, we need to also guard against overreaching; industry cannot be forced or intimidated into surrendering valid property rights, but the government has to exercise its rights and protect its interests at the same time as it respects industry’s. Further, we in the government must have strong technical and programmatic capabilities to effectively implement open systems. The Long Range Strike Bomber program is applying modular open systems effectively in its acquisition strategy and provides a good example of how this balanced approach can work—again, if there is strong technical leadership by the government.

Small businesses provide an excellent source of competition. Due in no small part to the strong leadership of the Department’s Office of Small Business Programs Director, Andre Gudger, we have made great progress over the last few years. We have improved our market research so that small business opportunities are identified and we have conducted numerous outreach events to enable small businesses to work more effectively with the Department. While much of our effort has been directed toward increasing the amount of Department

we have to work harder on the government side to ensure that the relevant risk associated with the actual product we will acquire and field is really reduced. BBP 2.0 reinforces this maxim, and I believe we have been correctly applying it over the last few years. This is one of many areas where simply “checking the box” of a favored acquisition technique is not adequate; real understanding of the technical risk and how it can best be mitigated is necessary. It is also necessary to understand industry’s perspective on these prototypes; industry cares much more about winning the next contract than it does about reducing the risk in the product that will be developed or produced under that contract. Competitive prototypes are successful when government acquisition professionals ensure that winning and reducing risk are aligned. The data shows that in many past cases they were not aligned.

Improve Tradecraft in Acquisition of Services

We have increased the level of management attention focused on acquisition of services under both BBP 1.0 and 2.0. I still see this as the greatest opportunity for productivity improvement and cost reduction available to the Department. I have assigned my Principal Deputy, Alan Estevez, to lead

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the Department's initiatives in this area. He is working with the Senior Service Acquisition Managers that we established under BBP 1.0 in each of the Military Departments. We have also now assigned senior managers in OSD and in each of the Military Departments for all of the several major categories in which we contract for services: knowledge-based services, research and development, facilities services, electronics and communication, equipment-related services, medical, construction, logistics management and transportation.

Our business policy and practices for services are improving. A counterpart to the often revised DoD Instruction for Programs, DoDI 5000.02, has been completed in draft and will soon be implemented. We have begun the process of creating productivity metrics for each of the service categories and in some cases for sub-areas where the categories are broad and diverse. We are also continuing efforts begun under BBP 1.0 to improve our ability to conduct effective competition for services, including more clearly defined requirements for services and the prevention of requirements creep that expands and extends the scope of existing contracts when competition would be more appropriate. Services contracting is also an area in which we are focusing our small business efforts.

Services are often acquired outside the "normal" acquisition chain by people who are not primarily acquisition specialists—they are often acquired locally in a distributed fashion across the entire DoD enterprise. Services are also often paid for with Operation and Maintenance (O&M) funds where specific efforts have much less visibility and therefore less oversight. The results achieved as a result of acquisition practices for service procurements are often not as evident to management, nor as well publicized as the results for weapon system. We are working to correct this by strengthening our business management (not just contract management) in these areas and to identify and encourage best practices, such as requirements review boards and the use of tripwires.

In summary, I believe that we have made a good start at addressing the potential improvements that are possible in contracted services, but we have more opportunity in this area than in any other.

Improve the Professionalism of the Total Acquisition Workforce

The total acquisition workforce includes people who work in all aspects of acquisition; program management, engineering, test and evaluation, contracting and contract management, logistics, quality assurance, auditing and many other specialties. All of these fields require high degrees of professionalism. I'm proud of our workforce; it is highly professional, but

there isn't a single person in the workforce, including me, who can't improve his or her professional abilities.

The addition of this major category in BBP 2.0 was the most significant adjustment to BBP 1.0. The specific initiatives included several measures to enhance our professionalism. Under the Defense Acquisition Workforce Improvement Act, the Department created three levels of acquisition proficiency. I don't believe that the standards for these levels as currently defined or implemented are adequate for the key leader acquisition positions that carry our highest levels of responsibility. We are in the process of creating and implementing higher standards for these positions. That process should conclude within the next year. As part of this initiative, we are conducting a pilot program to establish professional qualification boards. The pilot is being conducted by the Developmental Test and Evaluation community under the leadership of the Deputy Assistant Secretary of Defense for Developmental Test and Evaluation, David Brown. These boards will help to establish a culture of excellence in our acquisition career fields and DoD-wide standards for our key leaders. We are also taking steps to better define the qualification requirements for all our acquisition specialties. These qualifications will rely more heavily on specific hands-on work experience than we have in the past. Finally, we have taken steps to more fully recognize and reward our top performers. At my level, this includes spot awards as well as our standard periodic awards. We are making a particular effort to recognize the contributions of teams as well as individuals and to recognize exceptional performance in the full range of defense acquisition activities.

People matter. If there is one legacy I would like to leave behind it is a stronger and more professional Defense Acquisition Workforce than the one I inherited from my predecessors. The tide would seem to be against me because of events like pay freezes, sequestration, furloughs, shutdowns and workforce reductions—all brought about by the current budget climate. However, if there is one thing that has impressed me during my 40-plus years in defense acquisition, most of it in government, it is the dedication, positive attitude, resilience and desire to serve the taxpayer and our Servicemen and -women well that characterizes this country's acquisition professionals. Neither the public, nor everyone in Congress, nor even all of our operational communities seems to fully appreciate the nation's acquisition workforce. This country owes a lot to you; together with our industry partners, you are the reason we have the best-equipped military in the world.

I think that's a good note to close on. Thanks for all that you do.



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Prototyping

Increasing the Pace of Innovation

Capt. Richard Hencke, USN



Directing R&D money in order to build at least a few prototypes of systems the Pentagon knows it can't afford to buy in big quantities ... moves us forward technically. It keeps our industrial base healthy from a design perspective and it keeps our design teams together.

—Frank Kendall, Under Secretary of Defense for Acquisition, Technology and Logistics
(American Institute for Aeronautics and Astronautics, Jan. 18, 2014)

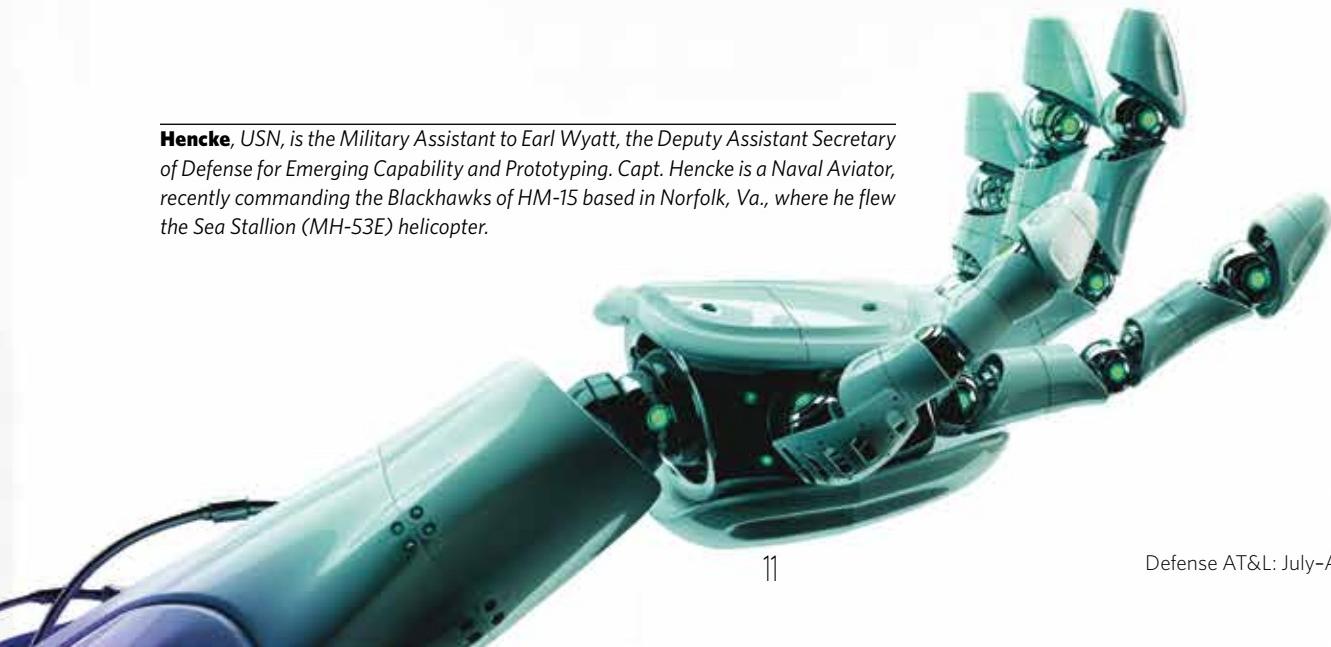
Prototyping has long been recognized as an effective tool for reducing technical risk throughout the development of complex weapons systems. A growing number of leaders in government and industry advocate that it can do so much more. Supporting their claims are recent studies suggesting prototyping can increase the pace and reduce the cost of developing complex systems, enable organizational cultural change, aid acquisition reform, advance the technical skills of the industrial base, and even deter rival nation-states from pursuing paths that threaten our national interests.

Prototyping's role in the capability development process appears to be changing, expanding from focused design tool to potentially paradigm-changing methodology. What once was just another trusted tool in the designer's toolbox has now blossomed into a collection of developmental and experimental activities that are maximizing the value of developing and working with intermediate forms (models or demonstrators).

A Risk Reduction Tool

For the last several decades, prototyping in the Department of Defense (DoD) has mostly been associated with the technical maturation of complex weapon systems. Increased interest in technical maturation prototyping followed the failures of many high-profile weapon system programs during the Cold War. The U.S. weapons development strategy at the time relied upon technical superiority to counter the Soviet Union's numerical advantage. The resulting pressure on the acquisition system to maintain a technological advantage encouraged heavy reliance on

Hencke, USN, is the Military Assistant to Earl Wyatt, the Deputy Assistant Secretary of Defense for Emerging Capability and Prototyping. Capt. Hencke is a Naval Aviator, recently commanding the Blackhawks of HM-15 based in Norfolk, Va., where he flew the Sea Stallion (MH-53E) helicopter.



"Gentlemen, we have run out of money; now we have to think."

—Winston Churchill



nascent and untested technologies. Acquisition programs suffered lengthy delays as they struggled to mature cutting-edge technologies. Of those programs that eventually fielded, many would falter under battlefield conditions. The 1986 Packard Commission report, a widely cited blue ribbon commission appointed by President Reagan, strongly advocated for "building and testing prototype systems and subsystems before proceeding with full-scale development."

An Expanding Role

An early hint of the expanded uses of prototyping came in 1947 when Chuck Yeager broke the sound barrier in the Bell X-1 prototype. The feat ignited popular interest and advocacy for big budget prototyping efforts that showcased significant U.S. technical achievements. The X-plane and space programs not only provided the deep understanding of how to operate in the air and space domain (knowledge the United States would leverage for decades), they helped create a virtuous circle of

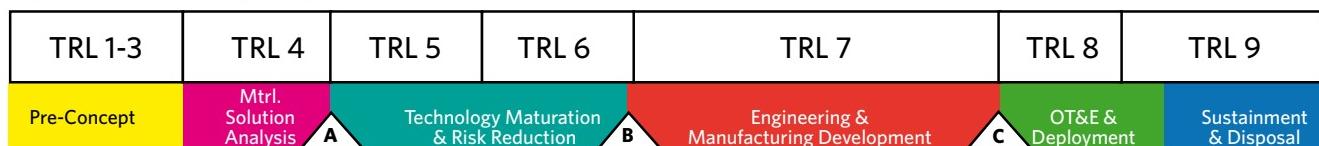
technology development, inspiring a generation to become the future scientists and engineers that would lead the next wave of technical discovery.

John Young, as Under Secretary of Defense for Acquisition, Technology and Logistics (USD [AT&L]) in 2007, advocated yet another role for prototyping, that of a mechanism to enhance competition. He directed major acquisition programs to develop competing designs early in the development process. DoD's competitive prototyping program, according to a 2009 RAND Corp. study, has met with mixed results. The RAND study suggested other factors such as requirements creep, budget instability and technical maturity may be more significant factors to cost growth.

Today's tightening fiscal constraints and the globalization of a diverse and expanding array of threats (that include long-range missiles, sophisticated air defense systems, and chemical weapons) have combined to form a one-two punch that has left the DoD's acquisition system staggering. The acquisition system can no longer afford the variety of systems necessary to sustain a technical advantage across such a large threat landscape. Even without resource constraints, it is unclear if current acquisition processes can adapt products quickly enough to address rapidly evolving threats. Many well-resourced weapons programs show their age and impending obsolescence before the first production run.

There is some cause for optimism. Historically, periods of constrained resources have been marked by extraordinary creativity and innovation. Declining budgets and restrictive arms treaties following World War I coincided with the innovative development of naval air power. Despite or, as Churchill would have said, because of declining budgets, this period was marked by bursts of creativity and experimentation that steadily advanced the state of naval air power throughout the 1920s, eventually resulting in the carrier-based air power systems and concepts that proved so pivotal to Allied success in World War II.

Figure 1. Prototyping Instruments



Developmental Prototypes

- Demonstrate feasibility of an integrated capability.
- Provide evidence of overcoming specific technical risk barriers.
- Develop sufficiently detailed cost data to enable cost-capability trades.

Operational Prototypes

- Demonstrate military utility of integrated capability solutions.
- Demonstrate robust fabrication processes.
- Demonstrate performance in specific operational environments.
- Define form, fit, function and "ilities"—e.g., supportability.
- Enable business case analyses.

Figure 2. Prototyping Methodology



To sustain the technical advantage against our adversaries, we must again create an environment in which creative thinking is allowed to flourish and a risk-accepting culture encourages experimentation of new and unconventional ideas. In this environment, higher risk and more innovative prototypes are avidly pursued and honestly assessed, unlocking new insights that can lead to potentially game-changing solutions.

And with new rapid prototyping techniques compressing development cycle times, iterating to better solutions has never been faster. Paul MacCready, the designer responsible for winning the Kremer prize for human-powered flight, argued that the success of his aircraft, the Gossamer Condor, should not be attributed to inspired design but to an inspired design process. He manufactured the Condor to be quickly reconfigured after each cycle of build and test. Competing designers labored over their designs for a year or more, only to witness failure that would require another year of development before another test. The Gossamer Condor could be reconfigured so quickly that testing five designs in a single day was common.

Capability development cycles, traditionally measured in years and decades, will need to be measured in months if they are to outpace our adversaries. Rapid prototyping technologies and techniques are well-positioned to support the need for reduced development cycle times. A well-outfitted rapid prototyping lab contains all that is needed to produce new products in days to weeks. Computer Aided Design and Manufacturing software linked to Computer Numerically Controlled (CNC) machines quickly mill, cut and build up material components. Combined with Field Programmable Gate Array integrated circuits, these tools allow prototyping labs to quickly build up and rapidly modify complicated new prototypes.

The Naval Air System Command's (NAVAIR) Aircraft Prototype Systems Division (APSD) exemplifies the new breed of rapid prototyping labs. Outfitted with design tools and CNC machines, APSD responded to a request for updated flare dispenser pods for several helicopter models. In the case of the AH-1W, APSD completed all the design work and fabrication of the first prototype in-house, in just three weeks. APSD then leveraged NAVAIR's instrumentation and test facilities at Patuxent River and China Lake to flight-test their new prototypes. The results were highly refined designs that offered the program managers significant acquisition alternatives including "build-to-print" solicitations. Because the design work was completed at NAVAIR, smaller fabrication shops, which lacked the specialized design expertise, could compete for the production work.

A Refocus: From Rapid Fielding to Emerging Capability and Prototyping

Recognizing the benefits of prototyping, the current Under Secretary of Defense for Acquisition, Technology and Logistics directed the Assistant Secretary of Defense for Research and Engineering's (ASD[R&E]) Rapid Fielding office to expand its focus beyond developing fieldable prototypes to meet the immediate needs of warfighters at war, including developing less technically mature prototypes that can quickly explore new ideas. To support the change, the office recently changed its name from Rapid Fielding to Emerging Capability and Prototyping (EC&P).

ASD(R&E)'s EC&P office is uniquely suited to take on this expanded role. Skill sets developed under the pressures of war adapt well to the more strategic mission of developing agile, flexible weapon systems. The office cultivated a large and diverse network that includes warfighters in the combatant commands and in the field, academia and traditional and non-traditional solution providers. Their network is a well-spring of innovation they can now exploit for a wider range of prototyping activities.

The EC&P office's existing capability development methodology also supports their new role. The office mined their networks for solutions that fit a tiered set of criteria. The team first looked for existing solutions they could repurpose to meet the warfighter's need. Their second choice was to identify systems that could be quickly modified or be combined with other systems to take on a role perhaps never imagined by the original designers. Only after they exhausted their networks of extant systems and solutions did they consider development of a new system from whole cloth. EC&P's "repurpose, modify and combine" methodology is an early progenitor of the modular, plug-and-play architectures we will need in our future weapon systems. As persistent threats evolve and new threats appear, future weapons systems must have greater flexibility and agility—flexible enough to cover a wide range of missions and agile enough to quickly adapt to fast evolving threats. Creating agile and flexible systems will require open architectures and modular-minded designs. Prototyping plays an important role by testing and demonstrating open architectures, acting as a champion for true plug-and-play versatility.

Housing a prototyping shop inside ASD(R&E) has other benefits as well. ASD(R&E) maintains strong connections across the military, government and commercial labs. ASD(R&E)'s cognizance of military Service core missions and paradigms will ensure they do not duplicate Service efforts or impinge

upon Service equities while still taking advantage of the best practices from each Service to satisfy joint and cross-cutting needs. Being ensconced in ASD(R&E) will also facilitate a strong connection to the Joint Staff, whose connection to all the combatant commands can help the new prototyping office identify hard warfighter problems that are both persistent and pervasive across the range of military operations for geographic and functional combatant commands.

Throughout Capability Development

To better manage prototyping activities, the new emerging capability and prototyping office is separating prototyping activities into two categories. Operational prototyping activities will closely replicate previous rapid fielding activities performed by the office. Operational prototypes can be expected to operate in the field for short periods and will incorporate form, fit and function into their design. Several of the system support considerations will also be assessed to help determine what aspects of the prototype will need to be matured for a follow-on program of record.

The second category, developmental prototyping, affords an opportunity to explore the operational and technical value of less mature weapon systems. Form, fit, function and life-cycle affordability are still considered in developmental prototyping but the focus is more on the prototype's ability to achieve useful military effects. Developmental prototyping allows for exploration of high-risk, potentially game-changing designs. Developmental prototyping can advance our technical understanding without necessarily transitioning to a program of record. Instead, tested and assessed developmental prototypes

can be "put on the shelf," where they can just as easily be pulled off should the threat environment warrant further development. This put-on-the-shelf strategy will maximize scarce resources by allowing the development of a broad spectrum of threat mitigating technologies without incurring the cost of a major development program with a full production run.

Prototyping activities are encroaching further and further to the left of the capability development timeline. Operational prototyping, a mainstay for risk reduction in systems nearing maturation, has been joined by developmental prototyping activities that explore less developed areas of the technical realm. The next step to the left is where problem definition and concept development reside. This step in the capability development process is so crucial because decisions made here drive most of the cost and resource requirements. Conceptual prototypes (e.g., mock-ups of systems, early prototypes and computer simulations) physically or visually represent early ideas and concepts, helping decision makers better understand the problem and reach agreement on an approach to solving it.

ASD(R&E) is considering steps to bring the prototyping culture into this conceptual realm. A construct is under consideration that will connect elements of the warfighting community with technologists and scientists through the use of live and virtual collaboration venues. These collaborations are intended to inform both the technology and requirements development communities. The initiative is still in its early development, but these new warfighter/technologist collaborations hold promise as a means of addressing some of the DoD's most challenging problems. By bringing together capability development stakeholders early to decompose and reframe our most challenging problems, these collaborations have the potential to identify new solutions using novel approaches.

Yes, Prototyping Can Do All That

The correct response to claims posed by the prototyping advocates is, "Yes, prototyping can do all that and more." When properly directed and executed, prototyping can support a broad range of capability development activities and strategic initiatives. A diverse prototyping portfolio of conceptual, developmental and operational prototyping activities can explore a wide swath of uncharted technical and conceptual territory, informing the development of new capabilities, stimulating design teams and maturing promising technologies that can ignite support at home while signaling to potential adversaries that fielded variants could be just around the corner.

Perhaps most important, a concerted focus on prototyping activities directed toward developing those critical enablers to innovation—open architectures, modular and reusable designs, and the early application of a rapid, iterative development cycle methodology—can help the DoD build the portfolio of agile and flexible systems it needs to outpace any adversary. &

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Soaring With AC-130J

A Decidedly Nontraditional Acquisition Strategy

David Breede

Five years ago, the Special Operations Warfighter identified an urgent need for more armed aircraft than was available with the current fleet of aging gunships. The United States Special Operations Command (USSOCOM) responded, and a new and innovative way of producing gunships was initiated.

In April 2009, USSOCOM kicked off an Urgent Deployment Acquisition (UDA) to produce additional close-air support assets by modifying the MC-130W fleet of 12 cargo and tanker aircraft with a Precision Strike Package (PSP). UDA programs are the USSOCOM equivalent of a Joint Urgent Operational Needs Statement. They are initiated to accelerate the fielding of materiel in response to a Combat Mission Need Statement or other urgent, high-priority, out-of-cycle acquisitions. In less than 20 months, the streamlined UDA processes enabled the 73rd Special Operations Squadron (SOS) to deploy to Operation Iraqi Freedom with two modified armed MC-130Ws, nicknamed Dragon Spear. Urgent acquisition programs are rare, and receive high priority for resourcing, issue resolution, testing and fielding—and program documentation is condensed or waived on a case-by-case basis.

The accelerated Dragon Spear program timeline was possible only because of the unique authorities that accompany a UDA. In comparison, the last gunship acquisition program, the AC-130U, took 11 years after the program was initiated to deliver the first modified aircraft to the Air Force Special Operations Command (AFSOC). The difference in program timelines is stark, and the reasons behind it are various. Now USSOCOM is looking to capitalize on the management strategies executed on the Dragon Spear program for more traditional acquisition programs like the AC-130J.

The Special Operations Research, Development, and Acquisition Center (SORDAC) created a small Joint Acquisition Task Force (JATF) to lead the Dragon Spear Program, integrate program activities and report directly to the USSOCOM Acquisition Executive. The JATF was a small group of program management, financial and contracting specialists whose challenge was to execute innovative management strategies and meet the demanding requirements of a UDA. Less than 12 months after the program was initiated, the first modified MC-130W was demonstrating its new suite of weapons, following delivery to Cannon Air Force Base (AFB), to support aircrew training and deployment preparations. Seven months later, an interim capability was deployed to Iraq. And 2.5 years after initiation of the UDA, PSP Capability Release 3—the objective configuration—was fielded on the MC-130W. On Nov. 18, 2011, crews from the 73rd SOS employed the new capability during operations in Afghanistan.

The success of the Dragon Spear program depended on rapid but disciplined program execution. Certain strategies were essential to limit the program's cost and schedule and provided lessons learned for those crafting the AC-130J program strategy. These included:

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1. Integrate proven technology in innovative ways to deliver new capability.

The PSP installed on Dragon Spear consists of sensor, communications, strike and operator control subsystems that by themselves weren't groundbreaking and in most cases had been proven in the field on other platforms. By assembling non-developmental and off-the-shelf sub-systems, the JATF significantly reduced both the integration and test timeline and technical risk.

The AC-130J gunship on its first flight.
Air Force photo.

2. Capitalize on existing resources and subject matter expertise across the Department of Defense (DoD).

Given the urgent need for additional close-air support on the battlefield, a strategy was crafted to assemble a team of existing experts from a number of organizations. Rather than spend the time and resources necessary to build up an organic and comprehensive program office with all the traditional disciplines, the JATF pulled in resources from across DoD, including all three Services and several contractors to form a network of Combat Acquisition Detachments (CADs).

3. Fail faster to accelerate development and fielding.

Instead of waiting until the design for the objective configuration had been fully vetted through the systems engineering process, SOCOM decided to field several capability releases building up to the final solution. This sped the process of validating subsystem compatibility, of getting user feedback, and essentially put into practice the slogan "Fail Faster." The faster you learn something doesn't work, the less time and resources are wasted trying to make it work.

Necessity may be the mother of invention, and the urgent requirement that resulted in the Dragon Spear PSP capability drove the innovative management strategies that shaved years and millions off of a more traditional weapon system acquisition approach. Therefore, when USSOCOM decided to replace its entire gunship fleet with new AC-130Js, we incorporated the lessons learned during Dragon Spear to execute the Acquisition Category (ACAT) II program, in a decidedly nontraditional manner.

In 2010, USSOCOM initiated a recapitalization of the aging AFSOC gunship fleet with the AC-130J Program. This program will replace the AC-130H, AC-130U, and AC-130W fleets with new, U.S. Air Force-provided, J-model C-130 aircraft modified with the latest version of the Special Operations-peculiar PSP. Since program inception, the SORDAC program management team has capitalized on the lessons learned and strategies executed for the MC-130W Dragon Spear modification. The challenge is to repeat the success of the MC-130W program under the construct of an ACAT II program as opposed to a UDA. The AC-130J program is paving the way for nontraditional military acquisitions



The AC-130J gunship undergoing modification. USSOCOM photo.

using the lessons learned with the MC-130W, and executing the program at a fraction of the cost and schedule required to produce the previous generation of AFSOC C-130 gunships.

The approved AC-130J acquisition strategy included “cross-decking” the Dragon Spear PSP configuration onto a donor MC-130J aircraft. By the time the AC-130J program reached a Milestone B decision in February 2012, both the strike package and the aircraft were proven and fielded systems. Program development and risk management were focused on the integration of the PSP with the MC-130J airframe. Incremental capability upgrades were considered, but the principle of reducing cost, schedule and risk by integrating proven technologies was applied again, rather than develop unique hardware and software solutions.

The streamlined documentation permitted under a UDA allowed the Dragon Spear program to hit the ground running as soon as the necessary Acquisition Decision Memoranda were signed. Although Dragon Spear was an ACAT II program as opposed to a UDA, program management was able to leverage the MC-130W program to complete all required Milestone B documentation in one year. This included the Life-Cycle Cost Estimate, Acquisition Program Baseline, Single Acquisition Management Plan and others.

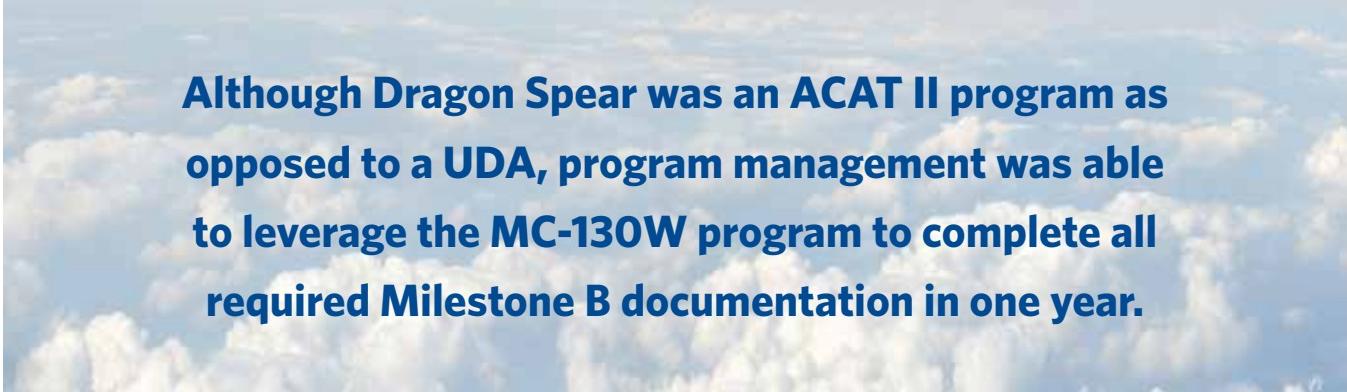
Program management relationships were also established during this time. Again, USSOCOM rejected the model of a large program office in favor of a distributed network of CADs, capitalizing on existing expertise across DoD as well as experience gained executing the Dragon Spear program. Prior to Milestone B, a Program Specific Memorandum of Agreement was signed committing six organizations from within USSOCOM, the Air Force and the Navy to the various roles necessary to execute the program. A small organic program management team, at the USSOCOM Headquarters, acts as the program integrator and synergizes program development, integration and test schedules with other closely related strike programs. As with the Dragon Spear JATF, SORDAC is taking advantage of the resources and expertise available across the Department and keeping the organic AC-130J program office lean.

Soon after the Materiel Development Decision, program leadership became eager to get to work—on a real airplane, instead of documentation and power point briefings. The production line schedule for MC-130Js did not have a donor airplane identified for the AC-130J program until the first quarter of fiscal year 2015. However, in June 2011, the AFSOC Commander approved a course of action, proposed by SORDAC, to pull an MC-130J out of the fleet two years ahead of

the original donor plan. This enabled the risk reduction plan to validate PSP subsystem compatibility with the MC-130J airframe and obtain user feedback as early as possible. While program management understood certain details of the configuration design would not be finalized in time for the first airplane modification, the benefits of getting actual hardware on an airplane far outweighed the management and technical challenges of retrofitting a small percentage of the PSP kit. The AC-130J executed its first flight in January 2014, less than two years after Milestone B, and the program can now

would be reversed after a defined, finite period. To maintain the aggressive AC-130J program schedule, the Air Force engineering authority at Wright-Patterson AFB implemented an innovative strategy of interim reviews and flight releases that recognized the incremental build-up approach to flight test incorporated in the program schedule.

Streamlined, efficient and fast-paced strategies do not have to be limited to urgent deployment acquisition programs. Available to any program is a conscious and deliberate program



Although Dragon Spear was an ACAT II program as opposed to a UDA, program management was able to leverage the MC-130W program to complete all required Milestone B documentation in one year.

move from estimating, predicting or assuming system performance to characterizing actual capability.

While the general strategy for the AC-130J program was to emulate Dragon Spear as much as possible, several challenges became apparent early in the AC-130J program. "Cross-decking" the PSP from a MC-130W to a MC-130J airframe was not as straightforward as anticipated. The J-platform has a different aircraft environment than the MC-130W and the modification had to be revised to accommodate the unique vibration profiles, pressurization levels and physical interfaces throughout the cargo compartment. In some cases, military standards were revised since the Dragon Spear modifications, and some previously sufficient certifications required additional testing to meet the new requirements. Small differences in the airframes would result in big problems if not adequately addressed in the planned aircraft modification. Through the practice of "failing faster," hardware interferences were discovered during installation—and environmental qualifications that fell short of the J-platform specific requirements, were brought up to the new standard. The AC-130J team heightened its focus on the detailed installation design required to implement the cross-decking strategy. Some designs have been modified to account for the unique characteristics of the J-platform, and all installation plans were thoroughly reviewed for compatibility.

Airworthiness reviews and the requirements to acquire a military flight release are different for the AC-130J than when the Dragon Spear was considered a temporary modification on the MC-130W. In 2011, the engineering review process was streamlined for a temporary modification that

management approach to tailor roles and responsibilities, utilize resources available across DoD, and build upon the success of previous programs to reduce risk. The effectiveness of these tools has been demonstrated in getting vital capability into the hands of the user faster and more affordably. The AC-130J program offers the latest example of how program managers can implement tailored nontraditional processes to meet the demanding needs of our warfighters. &

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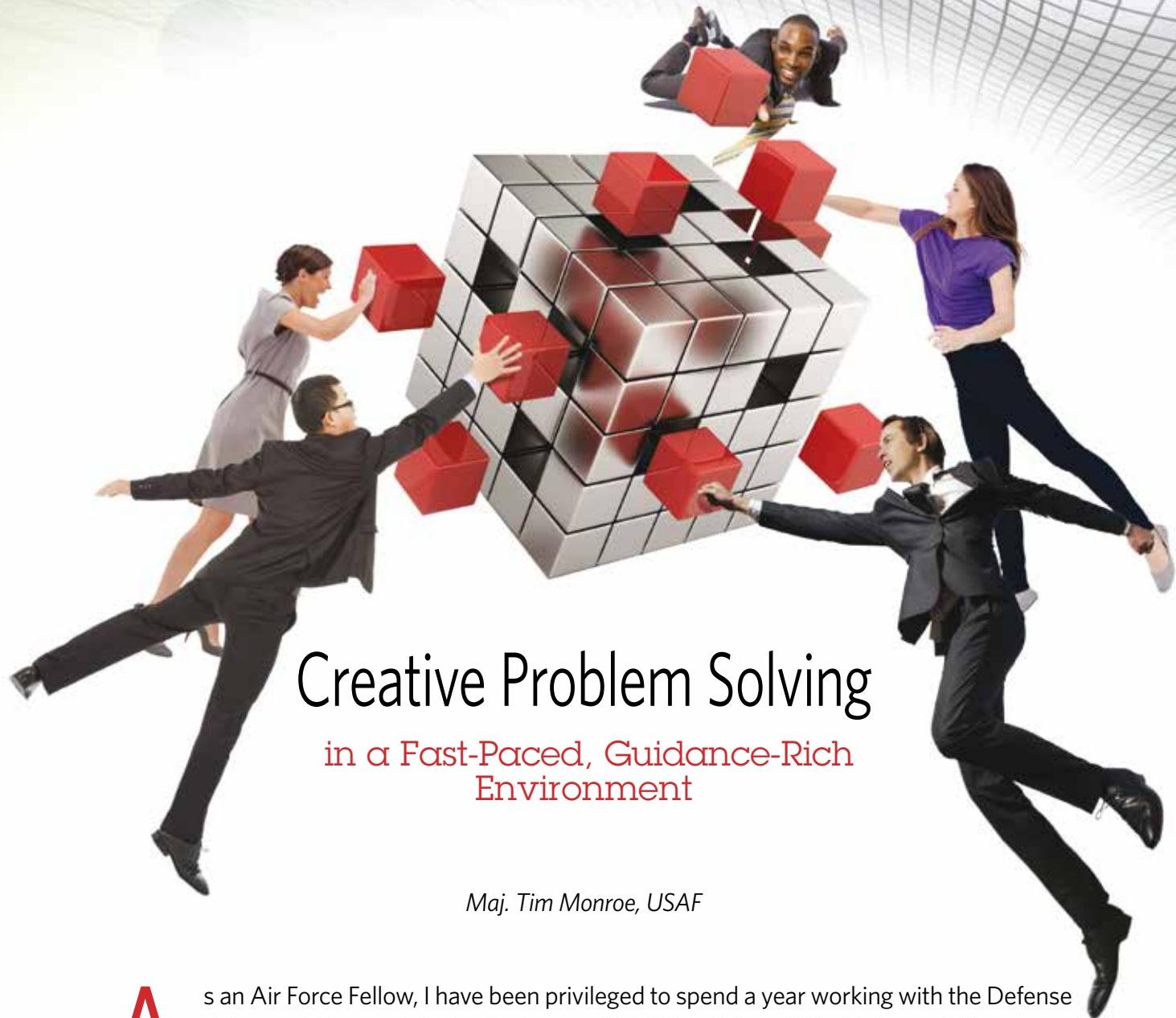
MDAP/MAIS Program Manager Changes

With the assistance of the Office of the Secretary of Defense, *Defense AT&L* magazine publishes the names of incoming and outgoing program managers for major defense acquisition programs (MDAPs) and major automated information system (MAIS) programs. This announcement lists all such changes of leadership for both civilian and military program managers that occurred in recent months.

Navy/Marine Corps

Douglas Dawson relieved **Capt. Michelle Guidry (USN)** as program manager for the Tactical Airlift Adversary and Support Aircraft (PMA-207) on April 17.

Capt. William Guarini (USN) relieved **Steven Lose** as program manager for the AN/AQS-20A Sonar Mine Detecting Set (PMS-403) on March 6.



Creative Problem Solving

in a Fast-Paced, Guidance-Rich Environment

Maj. Tim Monroe, USAF

As an Air Force Fellow, I have been privileged to spend a year working with the Defense Advanced Research Projects Agency (DARPA). Before DARPA, I spent 12 years as an officer and pilot of fighter and reconnaissance aircraft. It has been an eye-opening experience to join a team of professionals whose charter is to serve our nation by developing state-of-the-art technology to prevent strategic surprise and enable future capabilities for the Department of Defense (DoD). Though I will leave DARPA with countless tales of the dedicated people who work tirelessly to bring innovative concepts to life, I will also take with me a deeper appreciation for the creative problem-solving processes that cultivate the revolutionary ideas, technologies and programs that are the agency's lifeblood.

Monroe is an Air Force Fellow with the Defense Advanced Research Project Agency (DARPA). As an academic and research fellow, he supports the DARPA mission to maintain technological superiority of the U.S. military and prevent technological surprise from harming our national security. His broad tactical background is also leveraged to analyze future technologies critical in implementing strategic U.S.-coalition warfare capabilities. In addition, is an Air Force ambassador to solidify relationships with civilian and policy communities in the greater Washington D.C. area. The views, opinions and/or findings in this article are those of the author, who was assisted in this work by Scott Covit, Esq.



Guidance-rich environments can have the unintended consequence of stifling creativity when those who work in them do not feel empowered to adapt the existing guidance to the situation or develop new guidance if existing regulations are found irrelevant or inappropriate for the problem at hand.

The core cog of the fast-paced DARPA machine is the program manager. Talent is selected from academia, industry and government to lead pivotal early investments in innovation. One element of DARPA's environment about which all program managers are acutely aware is the mandatory short-term service that typically lasts two to five years. No one can escape the short service periods because DARPA is always searching for fresh perspectives. The mandate for short-term service extends to technical office directors and the director of DARPA. This is intentional and is the driving force behind the agency's fast pace. It motivates performance and is central to DARPA's rapid business practices, but presents the agency with unique challenges, including the risk management and thinking required to take on and resolve complex problems.

Program managers are surrounded by teams of experts to support their ideas and project development. These teams are diverse and represent specialties ranging from contracting and budget management to technical expertise. The agency's fast-paced, revolutionary work demands forethought and is a major reason these teams have such diversity but also why they must think through numerous problem sets at the earliest inception of a program.

To this end, the DARPA Security Team has developed a creative problem-solving process. Security traditionally is a compliance function. The developmental curve for personnel working in compliance-oriented functions usually evolves from learning relevant guidance to following and enforcing that guidance, adapting existing guidance to new problems and, occasionally, developing new guidance. For DARPA security, this is a developmental curve that must be accelerated and is a thought process worth sharing. This simple process, while discussed in terms of security for the purpose of this article, has many applications to work environments and career specialties that are guided by innumerable rules, regulations and policies. These concepts may also guide acquisition professionals referencing the *Federal Acquisition Regulation* and the *Defense Acquisition Regulation* as their primary regulatory manuals. Guidance-rich environments can have the unintended consequence of stifling creativity when those who work in them do not feel empowered to adapt the existing guidance to the situation or develop new guidance if

existing regulations are found irrelevant or inappropriate for the problem at hand. The key reasons behind the development and sharing of this process were:

- To empower the entire security staff to be part of the problem-solving process.
- To communicate clearly the need and expectation for the staff to think.
- To develop a staff that can operate in the gray space "beyond compliance."

The steps used to guide creative problem solving when working through challenging situations are described below, and the figures in this article illustrate the process.

Understand the problem. The problem-solving rubric starts with a well informed clear understanding of the problem. It is essential to invest time in accurately diagnosing the root issue(s) and not simply react to symptoms. Investing quality time at this point permits immediate focus on developing an appropriate solution. Conversely, not investing the time to understand the problem set may result in lost time and productivity or, worse, make the original problem more difficult to solve.

Core functional knowledge is critical. Understanding the foundational guidance of a career specialty is paramount. As a military aviator, I have often spent weeks in professional courses meant to bolster my knowledge as a pilot and tactician. In some cases, my technical orders, regulatory manuals and headquarters' guidance amounted to thousands of pages of text, diagrams and tables. These manuals were essential to learn the basics of my mission and continue to operate safely and proficiently. As it applies to this process, it is a foundation built on a compilation of the many hours spent scrolling though source documents, online training modules, classroom sessions and miscellaneous handouts describing examples and vignettes meant to grow a knowledge base. This general knowledge prescribes the black and white of one's duties. It is further developed through management-level standards, procedures, and expectations and applied with judgment informed by real-world experience. It continuously expands and is absolutely critical to a person's professional

Having core functional knowledge is critical in determining the relevancy of existing guidance but doesn't eliminate the need for reasoned judgment and problem solving when existing guidance does not prescribe a solution.

credibility and competence. A constant closeness and review of career educational opportunities will keep an individual prepared when the tough situations arise. If a problem does arise and the appropriate solution can be found in existing guidance, the solution should be applied. Having core functional knowledge is critical in determining the relevancy of existing guidance but doesn't eliminate the need for reasoned judgment and problem solving when existing guidance does not prescribe a solution.

Explore the essence of each problem. When building concepts and ideas for a revolutionary new idea, it is common to move beyond the intended purpose of existing guidance. By its very nature, guidance can become dated soon after it is published since it is typically anticipatory or reactive in nature. Tearing down boundaries and pushing the limits of what is possible is a necessary element to innovation. In turn, this may result in situations where there is no existing guidance or readily available precedent or standard. However, to protect these ideas and the sensitive work to develop them, a great deal of time is invested to understand the key elements of what is new, different and revolutionary. An example is from the 1970s, when engineers and scientists began looking for

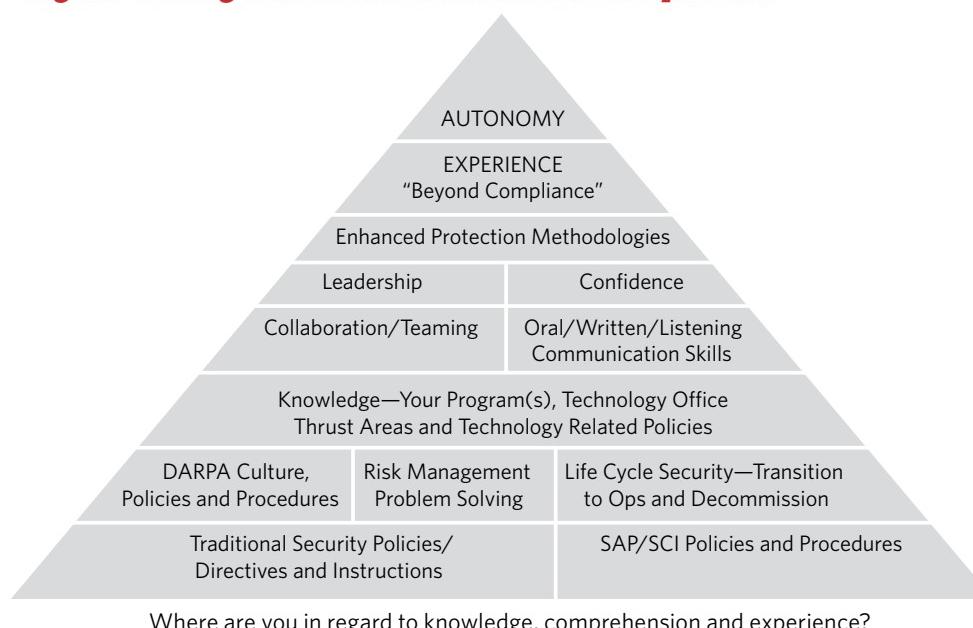
novel methods to reduce the radar signature of U.S. aircraft. This concept was born out of a desire to avoid detection in the skies above enemy territory and, especially, avoid radar systems looking to track and destroy U.S. aircraft. DARPA began a program—code named “HAVE BLUE”—to develop technologies for stealthy aircraft.

Due to stealth’s revolutionary concept and anticipated change to the world of tactical aviation, it was considered especially sensitive when being developed, and elements still remain classified. However, no regulation 40 years ago prescribed how to effectively safeguard it or how security would be applied if it became a part of the legacy of U.S. military aviation. Furthermore, what, if any, application could be made to other defense technologies? Challenges such as these, that stretch the bounds of existing policy, require us to ask questions, such as: What is the most sensitive or revolutionary element(s) of this program? How would a threat counter it? Is there anything sensitive about the engineering process? What would the enemy do with this sensitive information? The point of these questions is to apply experience through dialogue and identify critical points of security in order to begin shaping a tailored solution. This dialogue and

assessment is an iterative process, attempting to think a step ahead and always consider the consequences from probable or perceivable angles.

As a program or project grows in maturity, changes or new discoveries will be made requiring further creative and tailored security solutions. The question-and answer elements identified in these conversations will inevitably be helpful to shape the best solutions.

Figure 1. Program Protection Profession Pyramid



Analyze the problem against the constraints of existing guidance. With an understanding of what needs to be safeguarded, primary regulations and policy must be reviewed. At this point, core functional

knowledge is very important. This may seem intuitive and a repeat of the first step, but functions with intense, voluminous guidance can be cumbersome to navigate and are challenging when assessing from narrow or specific perspectives. In the case of stealth technology, it was quickly evident that no known safeguards were in place for such a concept. They simply didn't exist because the entire program was revolutionary to tactical aviation.

This thorough review of the current guidance and assessing relevance to the problem is critical. It is essential to the problem-solving process for a few reasons: Valuable time is wasted when a "new" solution is developed that is already prescribed elsewhere. Time is lost applying an inappropriate solution based on irrelevant or inappropriate guidance. Past examples can show what not to do. Identifying whether existing guidance is relevant and appropriate may be low risk and status quo, but requires thought. Either a solution can be applied or the need to continue assessing options will be apparent.

Recognize the need for an adaptive solution. At this stage, there is no immediate answer for the assessed problem. It is not black and white, but rather exists in the gray area and has extended into the realm of "beyond compliance." Identifying an adaptive solution requires a complement of experience, creativity, critical thought and risk management. Often guidance only partially prescribes how to deal with issues. In other cases, potential solutions may be found in precedence. For some of the work at DARPA, there are historic experiences to fall back on. Most often this is the case in air, land and sea technology programs because of the decades of experience within these domains. Newer domains like space and cyber are more challenging. These domains have less

historically relevant policy. However, when an adapted solution is required, it is important to consider unintended consequences. We don't want to fix one problem while creating another one elsewhere. Finally, consider if existing guidance should be updated to help those who may face the same problem in the future.

Recognize the need for an entirely new solution. For a DARPA employee, this is seen as another great opportunity to shape the future. This is the design space in which we thrive and is the grayest area of the problem-solving process. There will be no way to immediately confirm whether a proposed new solution will succeed, but the approach is likely to be as close to a sum total of all the previous steps as possible. Ultimately, the desired outcome is conceived guidance that helps to address the problem set and is inclusive of the analysis and thought invested in the previous steps. Shaping guidance should be broad and address not simply the specific problem that led to its inception but the larger application of a technology or security concept. Again, when a new solution is required, it is important to consider unintended consequences.

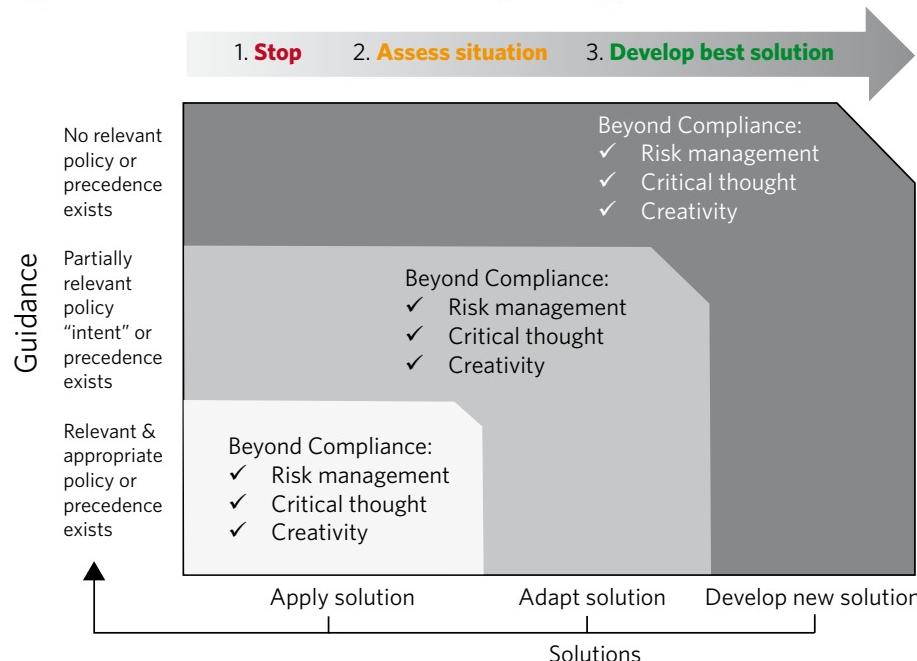
The key reasons behind the development and sharing of this process were to:

- Empower the entire staff to be part of the problem-solving process.
- Clearly communicate the need and expectation to think.
- Develop a staff that can operate in the space "beyond compliance."

For someone in security or other compliance functions who wants to accelerate the developmental curve to include adapting or creating guidance to support novel problems, this process may be useful.

Working as a team has propelled DARPA to continually expand the frontiers of technology as a leader within the DoD creating off-scale effect for our nation's leaders and warfighters. The organization's culture and approach to innovation have led to technologies that have forever changed how we protect and defend the United States and its allies. Those technologies began as ideas that were nurtured, guarded and secured by professionals who think differently about solving problems.

Figure 2. DARPA Problem-Solving Thought Process



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U.S.-Coalition Forces and Host Nations

DOTmLPF-P for Contingency
Procurements

Part II

(Conclusion)

Darren W. Rhyne



M

y previous article in the May–June 2014 issue of *Defense AT&L* introduced the application of the DOTmLPF-P construct for implementing a host-nation (HN)-first contingency procurement strategy. That article covered Policy, Doctrine, Organization and Training. This concluding article focuses on the remaining areas of materiel, Leadership and Education, Personnel, and Facilities. The recommendations herein are by no means exhaustive but are intended to provide some major areas to consider when executing a HN-first procurement policy such as we attempted to carry out in Afghanistan under Operation Enduring Freedom.

What is DOTmLPF-P?

To set the stage, I'll repeat the definition of DOTmLPF-P I gave in my previous article. The acronym DOTmLPF-P stands for Doctrine, Organization, Training, materiel, Leadership and Education, Personnel, Facilities and Policy. These are normally associated with the term "nonmateriel solution" when conducting capability-based assessments under the Joint Capabilities Integration and Development System (JCIDS). The JCIDS

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Kabul, Afghanistan. U.S. Air Force photo by Staff Sgt. Manuel J. Martinez.
Inset: A vendor fair in Afghanistan. Coalition forces photo.

Manual (January 2012) Enclosure A defines a nonmateriel solution as "Changes to doctrine, organization, training, (existing) materiel, leadership and education, personnel, and/or facilities, implemented to satisfy one or more capability requirements (or needs) and reduce or eliminate one or more capability gaps, without the need to develop or purchase a new materiel solution." The DOTmLPF-P construct can also be used to assess the possible effects of a materiel solution on those areas, most of which are captured in the Logistics functional area's 12 Integrated Product Support elements. In this article, I use the DOTmLPF-P construct to provide recommendations for contingency procurement operations in which host-nation vendors (HNVs) are used to supply or manufacture products for host-nation government (HNG) forces under the auspices of U.S. contracts.

Materiel

Materiel in the context of DOTmLPF-P means nondevelopmental items such as commercial-off-the-shelf (COTS) and government-off-the-shelf (GOTS). *The JCIDS Manual* states, "The letter 'm' in the acronym is usually lower case since Joint DCRs [DOTmLPF-P Change Recommendations] do not advocate new materiel development, but rather advocate increased quantities of existing materiel capability solutions or use in alternate applications."

Products to be manufactured by HNVs should be nondevelopmental items that already exist in the U.S. inventory or that the U.S. Government has the rights to have manufactured by foreign vendors. This speeds procurement time, reduces cost of developing new products from scratch and negates the initial need to train HNG personnel in new product development.

The items should be close to or the same as those already manufactured in the host nation (HN) so a new industry doesn't have to be stood up. Examples include textile/clothing/footwear, construction, and furniture, industries that usually exist in some shape or form in most countries. They should also be items with close transference to commercial items with both commercial internal and export market potential. Items should require minimum tailoring to the HN/contingency environment but the HNG should have input in tailoring existing items to meet its needs but be within the HNVs' capability to manufacture. Finally, materials used by HNVs to manufacture products under U.S. or HNG procurement efforts should come from reliable sources with processes and physical features in place to prevent substandard or fake material from entering the supply chain.

Leadership and Education

The JCIDS Manual discusses Leadership and Education in the DOTmLPF-P context as "the product of a learning continuum that comprises training, experience, education and self-improvement. The role of joint professional military education is to provide the education needed to complement training, experience, and self-improvement to produce the most professionally competent individuals possible." This article doesn't

focus on formal military education so much as on applied leadership and basic education.

U.S.-Coalition leadership needs to be supportive of and patient with local acquisition efforts. These efforts will take time to initialize given the distance and time zones between deployed and U.S. support, movement of materials into and within the contingency environment, time to find qualified, trustworthy HNVs and mentoring of HNG personnel. U.S.-Coalition leadership also should set and manage reasonable expectations for HN-first procurements. My one year as Chief of Local Acquisition in Kabul, Afghanistan, taught me that initial procurement schedules usually slipped by at least 50 percent and several doubled, due to known and unknown factors such as import of raw materials through HN Customs, shutdown borders and site visits postponed due to increased threat conditions. We somewhat derogatorily referred to this phenomenon, along with a usually less hectic work pace in both HNG and HNV personnel, as occurring in "Afghan Time." In a contingency deployment of 6 to 12 months, it can also be difficult for some U.S. leaders to accept that what they started when they arrived that they thought would yield results before they redeployed home actually did not get done. Young officers should be aware of this and be careful not to overpromise results to their leadership.

HNG leadership should ethically enforce HN procurement policies and prepare their procurement personnel to transition U.S.-sponsored procurements to HNG procurement organizations. They should work to eliminate graft and other forms of corruption, plus mitigate the use of nepotism to fill jobs with family members when there are more qualified candidates. These practices are sometimes culturally inculcated in the way of doing HN business and, therefore, alien to U.S.-Coalition mentors and difficult for HNG leadership to stop. The best practice I can recommend is for U.S.-Coalition personnel to lead by ethical example when conducting business in the HN so HNG and HNV personnel can see the benefits of conducting fair business practices according to procurement laws and policies. Ethical acquisition practices must start at the top if the workforce at large is to conduct business ethically. Having HNG procurement personnel shadow and observe U.S.-Coalition acquisition practices, especially those with the HNVs, can provide opportunities to mentor HNG procurement personnel in fair procurement practices.

While HNG procurement laws and policies may not mirror those of the U.S. or Coalition forces, the example set should be that of following the presiding procurement laws and policies, whatever they may be for a particular procurement, to foster an environment of trust between the government and commercial procurement entities.

The HNG needs a workforce educated in basic ethics, human rights and HN literacy to at least an eighth-grade level in order to conduct HNG procurements, understand U.S. specifications and deal with vendors ethically and within the laws of the HN.

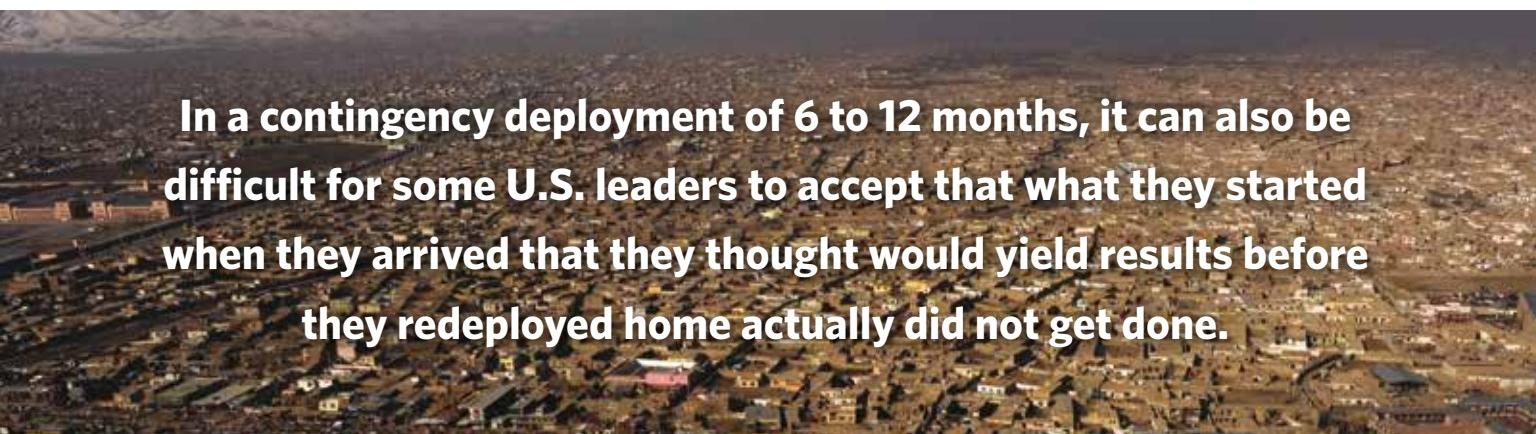
In countries such as Afghanistan where literacy is very low (less than 40 percent in most areas) and there is a heritage of oral education and communication, training the HNG workforce to read in its own language is very important. A literate HNG workforce can read the procurement policies and laws instead of relying on others to do it and possibly misinterpret their applications. A literate HNG workforce also can better understand and produce specifications and instructions provided to HNVs and the HNV written proposals they receive in return. Finally, the HNG leadership and its subordinates can better hold each other accountable for decisions made if the decisions are documented for a literate workforce to read.

HNVs also need a workforce educated to at least an eighth-grade level in order to understand their rights and be prepared to obtain training on manufacturing quality goods. Like their HNG counterparts, HNV personnel need to understand the HN procurement laws and policies to hold the HNG and their HNV competitors accountable for ethical and correct procurement practices. The HNV workforce should be literate so it can understand the specifications for producing the items under contract in order to achieve better quality. A literate workforce will also promote better workplace conditions since the

first attempt a couple of times in Kabul, even when accompanied by two locals. That put us at risk and resulted in mission postponement (more of that "Afghan Time").

It is not enough for the interpreters to know standard English. They also need to be versed in "DoD-ese," which includes unique terms, some slang and many acronyms. English, with its synonyms and homonyms, is a tough language to understand in and of itself, and the version spoken by DoD personnel is even more so. Having an interpreter who is accustomed to working with American military forces, who can put what we say in proper context, and who has some technical background is a major benefit to conducting procurements with HNVs and mentoring HNG personnel who don't speak English.

As a related example, the Defense Acquisition University conducted two tailored Production, Quality and Manufacturing (PQM) 201 courses for Afghan Ministry of Defense (MoD) and Ministry of Interior (MoI) personnel in mid-2011. For the first course conducted for the MoD, an Afghan National Army captain, who was my liaison to the Afghan Acquisition Agency during my deployment, interpreted for the class. His English, which we initially thought passable for the class based on his



In a contingency deployment of 6 to 12 months, it can also be difficult for some U.S. leaders to accept that what they started when they arrived that they thought would yield results before they redeployed home actually did not get done.

workers will better understand their rights under whatever workplace safety, occupational health, pay and benefit requirements may exist in the HN laws.

Personnel

According to *The JCIDS Manual*, "The personnel component primarily ensures that qualified personnel exist to support joint capability requirements." This is important for U.S.-Coalition and HNG procurement personnel and the HNV workforce.

U.S. local acquisition forces need to have proficient interpreters who are knowledgeable of the HNV environment. I list this first, since being able to communicate quickly and accurately with HNG and HNV personnel is critical in a contingency environment. The local interpreters also should be knowledgeable of the layout of the HNG and HNV places the U.S.-Coalition forces need to visit so they can guide them there, if that is needed. We were unable to find a new HNV location on the

performance in-theater, was inadequate in an academic environment. For the MoI course, a dedicated interpreter with a technical background (formal medical education) was hired and the course was much more effective and enjoyable.

U.S. local acquisition forces need to have proficient HN accountants to help them process vendor payments. Prompt, correct payment of HNVs for goods they accurately delivered in a timely manner is very important to all parties. Having HN accountants who can track deliveries with HNVs and discuss procurement-related issues with them is a necessity.

U.S. local acquisition forces should have personnel proficient in requirements development and translation of those into technical requirements, Request for Proposal (RFP) preparation, source selection conduct, contract management and quality assurance/management. However, while it doesn't really matter in what specialty they are trained prior to deployment, it is

much easier to begin or continue procurements if personnel are familiar with acquisition practices before being deployed. In the end, as long as the personnel are trainable and willing to work, almost any career specialty can perform deployed HN-first acquisitions. We turned an Air Force captain who was a human resource specialist into our boot program manager in a few weeks and provided a little extra guidance along the way. *The Joint Manning Document* contains the rank, skills and training requisite for each deployed position which, in turn, directs predeployment training for personnel. However, personnel can be retasked en route or shortly after arriving in theater, so keep tabs on those with acquisition training slated for the local acquisitions unit to ensure the unit holds onto them, if possible.

HNG procurement and Customs organizations need enough personnel skilled in HNG procurement policies, processes and procedures. Personnel need to be paid adequately to reduce the temptation of graft. While it is valuable for HNG procurement personnel to observe how U.S.-Coalition forces procure items for them from their HNVs, ultimately the HNG procurement personnel must learn to do it for themselves according to their laws and policies. Their organizations must be adequately staffed with skilled, literate, ethical personnel paid an adequate salary so they are not enticed to augment their pay by illicit practices. In Afghanistan, the coalition forces established a set of capability maturity metrics with which to measure the performance of each ministerial organization. The capability of the ministerial personnel to do their jobs weighed heavily in the overall assessment. The HNG procurement personnel from field units to headquarters should be assessed at the beginning of the contingency and a capability development plan put in place to monitor their progress.

HNG logistics personnel, who will likely receive the procured goods directly from the HNVs, also must be skilled at properly accepting and rejecting items under the terms of the contract. This was a frequent problem during my deployment that sometimes resulted in our intervening with the Afghan logistics personnel to properly receive items for which we had contracted and paid HNVs to produce and deliver. Sometimes there was good reason for the rejection, other times not, and sometimes we waived minor discrepancies to get the products into the logistics systems so the Afghan troops could get them as soon as possible. While each situation was slightly different, over time the receiving personnel gained the experience and skill necessary to do their jobs.

HNVs need enough personnel skilled in manufacturing the items to be procured. As previously stated in the Materiel section, most countries have some indigenous industry that can be used to manufacture military-related items, especially dual-use items such as construction, clothing, footwear and furniture. Understanding these capabilities can allow the U.S.-Coalition forces to focus the HN-first procurement strategy to those items the HNVs are readily able to produce. Because military items sometimes require manufacturing to a higher standard than perhaps the HNVs are used to, having

a skilled, literate workforce is a key to successful procurements from HNVs.

Facilities

The JCIDS Manual defines facilities as "Real property consisting of one or more of the following: buildings, structures, utility systems, associated roads and other pavements, and underlying land." Adequate, secure, accessible facility space is usually at a premium in a deployed environment for all parties.

U.S. local acquisition personnel need facilities on their forward operating base (FOB) in which to conduct source selections. This includes space to securely store vendor samples. On Camp Eggers in Kabul, we stored vendor samples in our building's basement (it was a pre-existing Afghan building) and in standard shipping containers on or near the vehicle parking area. This was not optimal but was the only storage space we had. We worked with Kabul Regional Contracting Center (KRCC) to find a dedicated space with office equipment and supplies in which to conduct several source selections so we could maintain the integrity of the process.

HNG logistics organizations need secure, environmentally controlled facilities to store products received from HNVs. It does little good to procure quality products if they will not be stored and managed properly. Shipping containers are a poor substitute for an environmentally controlled, well-organized and managed warehouse and can lead to product breakdown due to temperature extremes and moisture invasiveness. Procurement personnel should ensure that the products they procure are packaged, stored and managed correctly so they do not degrade or suffer from pilferage, mishandling or hoarding before they are issued to the HNG forces for which they are intended.

HNVs need secure facilities to prevent theft and attacks/intimidation by criminals/insurgents, and safe facilities for their workers. They also need reliable infrastructure for their manufacturing facilities. This can be a combination of HNG infrastructure (power, water, sewer, roads) and HNV infrastructure (generators, walled compounds). Many vendors I toured in Kabul were inside walled compounds with their own security guards and generators since the city power grid was unreliable. U.S.-Coalition personnel should be aware of these private security guards, especially when they try to conduct short-notice or unannounced visits. Again, a good interpreter is key.

Conclusion

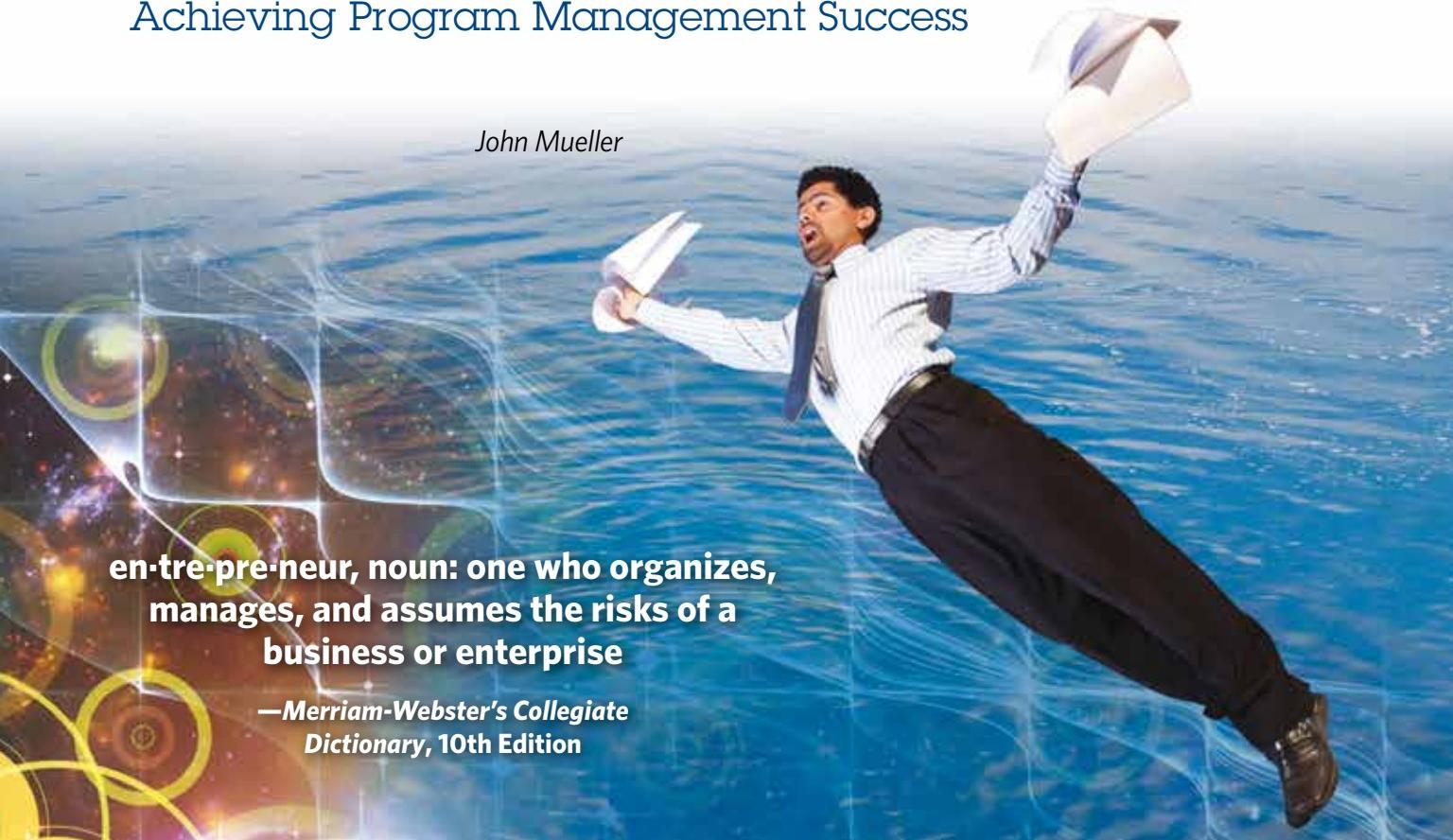
The DOTmLPF-P framework provides a useful basis in which to prepare for and analyze a HN-first procurement strategy. While the issues covered in these two articles are not by any means the last word, they do represent some lessons learned during my deployment as Local Acquisitions Chief in Kabul in 2010-2011 that can translate to other similar contingencies. &

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Are You Truly "All In"?

Achieving Program Management Success

John Mueller



en·tre·pre·neur, noun: one who organizes, manages, and assumes the risks of a business or enterprise

—Merriam-Webster's Collegiate Dictionary, 10th Edition

Are you an entrepreneur? Are you passionate about the successes of your program and your team? Does "risk" not only describe threats but areas for opportunities? Do you work your budget to ensure that you get the maximum output from every dollar? Do you have the "right stuff" to be counted among the future entrepreneurial program managers (PMs) within the Department of Defense (DoD)?

Today, the label entrepreneur is attached to breakthrough economic success resulting from the pursuit of new products and business applications with an eye toward incorporating technology innovation. These opportunities frequently occur when new management approaches are combined with "leap-ahead" technical breakthroughs. Diverse examples from the past include refining oil into kerosene as a replacement for whale oil for home lighting in the late 19th century, developing the mass production of cars to replace horses as a means of transportation in the 20th century, or creating low-cost smartphones to supplant phone booths for on-the-go communications in the early 21st century. In these and many more cases, entrepreneurs were the visionaries who implemented innovative solutions to solve problems, establish new levels of capability and capture great rewards for themselves.

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Applying the principles of entrepreneurship to the DoD PM role initially seems an odd choice. Government PMs rarely are described as innovative, and their duties are more frequently linked with stewardship rather than entrepreneurship. However, given the current budgetary pressures and unlimited threats, discovering new methods and incentives to achieve economic and technical breakthroughs is not only desired but could make the difference between program success and cancellation. In this light, I suggest that we look to entrepreneurship leadership traits in our next generation of PMs.

- Status—will you be remembered as innovative and forward-thinking?
- Accountability—what is your No. 1 concern; yourself, the warfighter, the process, etc?

Entrepreneurial skills should complement the traditional leadership attributes desired in the DoD PMs. Common entrepreneurial traits such as being opportunistic, decisive and dedicated should be highly desired in PMs. Too often, risk-averse leadership have seen individuals exhibiting these traits

The lack of resources is a motivator for innovation. Recall that the pursuit of technical innovations has been the source for many entrepreneurial breakthrough products that we now can't live without or that we even take for granted.



What Is Required?

The key characteristic of entrepreneurial leaders is their attitude of “all in.” Not only are they personally involved but in many ways they risk their personal capital to achieve the desired outcome. Frequently, their personal wealth is tied to the product and, consequently, they are highly incentivized to ensure they get a return on every dollar invested. While not advocating that government PMs contribute monetarily to their programs, the concept of “all in” goes beyond holding a personal financial stake. It starts with the right attitude. All PMs should act like every dollar a program spends belongs to them and it’s their responsibility to ensure maximum return on it. Program funds are theirs to spend rather than just a taxpayer account they are asked to manage. This approach will:

- Encourage the discovery of potential areas with competitive advantages that can be exploited to DoD’s advantage while remaining focused on achieving “win-win” solutions.
- Foster creative thinking to find innovative solutions to program challenges—a willingness to do something different rather than adopt a checklist mentality.
- Convert abstract ideas into concrete steps toward desired outcomes.
- Seek full understanding not only the costs of action but the costs of inaction, providing the ability to evaluate a situation to the PM’s advantage and to take actions toward an optimal outcome.

“All in” also requires nonfinancial commitments including a PM’s:

- Reputation—what will you want to be remembered for?

as “leaning too far forward.” Within a risk-adverse culture, over time individuals with these traits tend to be “weeded out” or self-select away from key program management positions. This can result in DoD’s PMs being characterized as little more than “play it safe” leaders who risk little of their personal capital—reputation, status, accountability—in managing their assigned duties.

Are You Ready to Join the Movement?

In addition to exhibiting greater personal accountability and financial ownership, a few other key entrepreneur skills are needed in the next generation of PMs. These include:

- In-depth market awareness
- Ability to inspire innovative thinking
- Identification and pursuit of opportunities
- Action-orientation default setting
- Willingness to take “smart” risk

If these skills are not in your toolkit now, no need to fret: Each of these represents a skill that can be learned by upcoming program leaders and then applied to enhance your ability to achieve success.

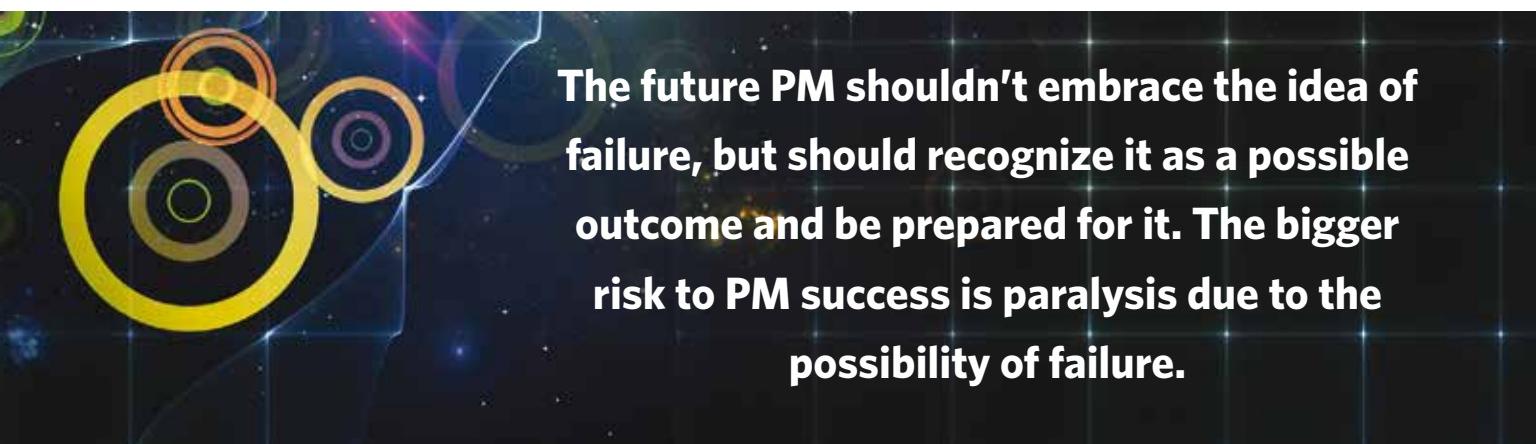
Market Awareness. Rather than focus just on a stovepipe of activity, the entrepreneurial PM identifies and understands market drivers and emerging trends that influence policy, technology, the industrial base and threat actors. Their analyses identify leading indicators for future opportunities, and this knowledge positions the PM and program office for success. The methods for obtaining this awareness are varied, but include reading technical journals and attending technical

conferences. However, one of the best and least-expensive ways to develop and maintain market awareness is by simply talking with a variety of people from industry and academia. This requires extending your contacts beyond the typical inner circle—such as your friends, people in your program office, your prime contractor—to include individuals in the labs, in related industries or those who analyze, write or invest in the defense industry (such as the media and Wall Street). Also, successful market research depends on listening more than talking. A critical market research skill is the ability to ask the right question that allows emerging risks and opportunities to present themselves. Your objective for market research is not to describe what it is (the current state) but rather to get an accurate picture of what could be (the future state). Finally, one of the quickest ways of making market research part of your daily activities is to commit some of your personal investments into a stock portfolio (not mutual funds). Nothing speeds one's understanding of industry financials better than a personal stake in the outcome of your own research.

Innovation. By their nature, most effective DoD PMs seek to find creative means of meeting their acquisition challenges—thus their aversion to checklists. However, large amounts of creativity are seldom generated when money is readily available. Why? The availability of funds influences the PM's risk-versus-reward equation away from risk taking. On the flip side, the adage that "necessity is the mother of invention" is equally true. The lack of resources is a motivator for

Opportunity. In challenging times, there is a natural tendency to adopt a defensive stance to ensure survival. Think moats around castles. Employing this strategy can have short-term advantages and appear to be a "win." But was it really a win, or just the temporary avoidance of defeat? Today, just as was the case in the Middle Ages, your foes eventually will figure out a way to defeat even the best defense. Rather than retrench during challenging times, an entrepreneur looks to capitalize on the strengths of his or her organization as an opportunity to grow value. This counterintuitive strategy has been used in the corporate world to grab market share in down times, realizing that the payoff in profits will not be immediate but the "win" will come during the next upswing. Similarly in DoD, during the current budget downturn, there are opportunities to provide solutions that might not have been tried in flusher times. For every new program not pursued, there is likely an existing system that can contribute to that gap. This includes reuse, repurpose and life extensions as alternatives to the new system—possibly with lower cost and less risk. For each of these "wins," the answer lies not in what the existing system defines as a solution but in what the manager sees beyond the current solution set to solve a problem for the future.

Action orientation. The common DoD program management approach can be likened to sailing a boat. The PM's primary role is to provide the course setting (vision), enforce performance standards (implementation approach) to ensure the crew does its job, and make course corrections as



The future PM shouldn't embrace the idea of failure, but should recognize it as a possible outcome and be prepared for it. The bigger risk to PM success is paralysis due to the possibility of failure.

innovation. Recall that the pursuit of technical innovations has been the source for many entrepreneurial breakthrough products that we now can't live without or that we even take for granted. Most of these innovations were not developed by people with great resources. They were developed by those who started at the bottom. Similarly, the DoD now needs innovation. These ideas come in many shapes and forms, but one truism is that the leader is seldom the only source of innovation. Thus, for the new generation of DoD PMs, a key leadership trait will be the ability to work with all members of their teams to inspire innovative ideas, to be open to new approaches, and to foster and develop team members and ideas that have the greatest potential.

necessary to arrive safely in port (vision completed). This "steady as you go" approach works well in calm seas and light winds. However, the current budget climate for DoD forecasts nothing like calm seas. Success in this challenging environment requires a more hands-on approach. The entrepreneurial PM's role goes beyond setting a vision to include motivating, demonstrating, coaching and, when necessary, doing the work himself or herself. Entrepreneurial PMs inspire action and attract like-minded people to their visions via compelling implementation strategies. This results in cultures of expectation and achievement. A leader with a vision but without an implementation strategy results in only a catchy phrase and a program failure.

Risk taking. A frequently attributed entrepreneurial trait is a high tolerance for risk. This attribute allows entrepreneurs to take on challenges when others would run the other way. While risk tolerance is an important PM feature, a more important trait for an entrepreneurial PM's success is the innate ability to accurately calculate risk. This ability is what allows an entrepreneur to avoid the "crazy" risks and focus solely on those risks where the potential payoff merits their effort. The tool available for the DoD PM in this area is the Business Case Analysis (BCA). Properly executed, a BCA provides the outline for success by highlighting both the potential costs and potential rewards. Finally, the future PM shouldn't embrace the idea of failure, but should recognize it as a possible outcome and be prepared for it. The bigger risk to PM success is paralysis due to the possibility of failure. This validates the old saying, "The higher the risk, the greater the reward." But to get any reward, you must at least be willing to get in the game.

How to Join the Movement

No matter what your current role in the acquisition process—supervisor, peer or subordinate—you can play a crucial role in developing and retaining entrepreneurs in the DoD. If you are a supervisor, the No. 1 thing entrepreneurial PMs need is your support. Give them the ability to improvise and don't

punish them for taking a reasonable risk that goes against them. As a leader, you should foster a culture in which people are allowed to learn from mistakes but understand that they shouldn't make the same mistake twice. If you are a peer, you represent the greatest intellectual resource available. Share your experiences so you can lift up the whole practice of program management within your organization or command or Service. If you are fortunate to work for a PM who is trying to innovate and try new things, buy into the process rather than cling to the status quo. You might just enjoy the ride.

Final Words

Our customers (warfighters) and investors (i.e., the taxpayers) depend upon the acquisition system to deliver the capability to stop those who would do harm, to protect those who are our friends, to assist those in need and, most of all, to provide the capability necessary to return home safely. Our challenge is to create an abundant return on the investment placed in the acquisition community. To achieve this return in the current challenging budgetary environment, entrepreneurship can't be the exception but must become part of the DoD acquisition culture. In the end, our customers and investors are "all in." Are you? &

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The Zen of Government Program Management

(aka Lessons Learned from a Defense Program Manager)

Stephen E. Armstrong

In 1986, I started keeping a list of profound lessons I had learned as an operational test director, defense contractor, government project engineer, and government program manager (PM) for mostly non-major acquisition programs (i.e., ACAT [Acquisition Category] III, IV) and a couple of ACAT I programs. I would jot them down on a special page in my “paper brain” as they occurred to me, sometimes in the heat of the moment, but usually during quiet periods of retrospection. In defense acquisition, we get a lot of education and training in managing research and development, much of which is the best in the world. But most of it is nuts and bolts, driven by the numerous laws and regulations that govern federal programs and contracts. The lessons below aren’t necessarily driven by anything more than common sense, experience and, as W. Edwards Deming put it, “Profound Knowledge” of the system.

Armstrong, a retired Navy Reserve captain, is the special assistant to the acquisition executive at the United States Special Operations Command (USSOCOM). Prior defense acquisition tours include assignments as USSOCOM’s program manager, Undersea Systems; deputy program executive officer, Naval Systems, and numerous project manager and project engineer assignments at USSOCOM and in the Navy. He got his start in defense acquisition as a Navy operational test director, and would like to thank his first acquisition mentor, Capt. Lee Frame.

These lessons generally fall into four areas: Program Teams; Contract Architecture; Design and Engineering; and Sponsors and Money. Over the years, I've provided these to my colleagues, both inside the government and outside such as at the Marine Technology Society's Underwater Interventions conference, and usually received positive reviews. So I'm providing them here in the hopes that readers will be able to glean some nuggets of value.

Start Each Briefing with a Picture

A wisely chosen picture or two will set the scene and get the audience focused and in sync. They can be used to explain complex relationships or systems. Pictures help an audience unfamiliar with the topic quickly understand and grasp the context of the rest of the presentation.

Program Teams

Gather the Best People You Can Find, Then Listen to Them and Smooth Their Paths

Management in high-technology programs usually involves more coaching and less directing. Program offices most often consist of skilled specialists in engineering, finance, logistics and government contracting (an arcane science unto itself). An acquisition PM acts more like a coach than a traditional military leader. He may develop the strategy and send out individual plays to be executed but relies on the specialists in the field to execute. A good manager will run interference with outside stakeholders and look down the road for issues and obstacles that will face the team.

Develop a Network of Capable People

As you journey through your career, take note of the exceptionally capable people you come in contact with. Then work to cultivate continuing relationships with them. Many of us engineers are introverts, so cultivating relationships may not come naturally. Drop by these people's offices occasionally, send them periodic e-mails, or reach out to them on Facebook or LinkedIn. By building and maintain a network of competent people that you can call on, you've multiplied your own capability.

Make the Program Fun

- It attracts good people.
- It keeps good people.
- Everyone else will be envious.

Developing new military systems and products is inherently cool. We get to see new stuff years before the military at large or the public. But many people working in the trenches of a program management office or acquisition command are insulated by their jobs from experiencing the new products as those products are designed, built and tested. Work to break down that insulation. Techniques I've used: Celebrate achievements and milestones whenever possible, post large pictures and drawings on the walls, share test videos with the staff online, exhibit or demonstrate prototypes at the command, give rides on prototype vehicles to the program team and

acquisition command staff when feasible, use Defense Connect Online to the builder's site to let staff members see the systems as the systems are being built. In addition to making a program more enjoyable, providing a firsthand experience to a comptroller or capability assessment staffers can provide dividends during the Program Objectives Memorandum and budget process.

Keep Your Prime Happy or Be Miserable

In many ways, the relationship between the government program management team and a prime contractor is like marriage. Generally there are long courtships and competing suitors. There always is a big party at the beginning and hopes for a long, successful relationship. There are competing interests and demands, and a necessary give and take between the partners (we even call them our "industry partners" now). Almost always there is some conflict, and resolving conflict together can make the relationship stronger. Sometimes conflicts don't get worked out, and the relationship ends prematurely. And sometimes events beyond either party's control destroy the relationship. But if your prime contractor is unhappy, you're going to end up being unhappy too.

Contract Architecture

Don't Put Design and Production on Opposite Sides

As anyone who actually has read one knows, a U.S. Government contract is a hodgepodge of unrelated requirements, statements, policies and procedures. Much of it is not directly related to the task at hand but is designed to promote societal goals. Also, it includes numerous mandated "fixes" for prior problems, bad acts and failures that have been regulated or legislated into existence, many of which conflict with each other. Additionally, government contracts are difficult to establish, difficult to change and intolerant of unknown risks. System Design and Development are iterative creative processes—i.e., a journey of discovery which requires intense communication, close cooperation, give and take and trade-offs between the engineers, technicians, logisticians, suppliers, etc., to achieve a satisfactory product. I have occasionally seen successful high-tech products such as the SEAL Delivery Vehicle Mark 8 designed by the government and produced by the government. I have seen numerous successful high-tech products designed by industry and produced by industry. But I haven't seen successful high-tech products that have been designed by the government and then produced by industry. Usually these programs end up being canceled once industry comes back with all the necessary changes to make them producible. Or else industry redesigns the product prior to production, which ends up invalidating much of the previous testing. So the lesson is that it's better to have either government labs, engineering centers, or shipyards/depots design and manufacture the system or have private industry design and manufacture the system.

Don't Get Between a Prime and Its Subcontractor

There's a tremendous desire on the part of government managers to dictate to a company how to design or build a system.



Members of Navy SEAL Delivery Vehicle Team Two (SDVT-2) prepare to launch one of the team's SEAL Delivery Vehicles (SDVs) from the back of the Los Angeles-class attack submarine USS Philadelphia (SSN 690) on a training exercise.
U.S. Navy photo by Chief Photographer's Mate Andrew McKaskle

Much of this desire is based on the technical experience of the government's engineers on other programs. Contractors, as a rule, will try to comply with their customers' desired process, but may need additional time and money to deviate from their planned programs. With a well-organized prime contractor and a good prime-government relationship, the responsibility to address cost and scheduled impacts can be quickly analyzed, negotiated and allocated. However, when the government and subcontractor technical personnel work together without the involvement of the prime, it ends up as a three-party negotiation, which is very challenging. With the prime's personnel excluded, it becomes much more difficult to allocate fairly the responsibility for schedule/cost growth. In such cases, the government unwittingly ends up assuming the liability for most of the cost and schedule increases.

Contract for the Whole Program Up Front

Include production, full life-cycle sustainment, and maybe even disposal (if unusual) as options. You can always fine-tune the contract during execution, or decide not to exercise a contract option if better opportunities arise (e.g., government life-cycle sustainment). The Special Operations Craft Riverine (SOCR) contract (ACAT III) included two years of design and development, 10 years of production options, and 14 years of sustainment engineering, parts, planned maintenance and modifications. It was built on the success of the 1996 Naval Special Warfare Rigid-Hull Inflatable Boat contract (also ACAT III), which included design, development and fixed-price production options. The SOCR contract was awarded in 2001. It's

still a fully utilized contract and serves as the model for newer contracts. The big "if" is technical complexity. If the product is not overly complex, or if multiple competitive prototyping is used to reduce risk in more complex programs, this technique allows the majority of the production price to be set during the initial competition.

Have Reprocurement Rights, Just in Case

When a new system is being developed, the builder often brings his own intellectual property (IP) into the program. In many cases that's why the government has competitively selected the builder. As part of the competition, include within the last priced production option period a priced option for a contract line item to license the builder's IP for additional production. This enables the government to recompete for additional production or just provides leverage needed to get a better price with the original equipment manufacturer (OEM) for additional production.

Design And Engineering

Prevent "Informal" Requirements Growth

Well-meaning government engineers and operators can unintentionally cause a design program to become much more difficult, expensive and lengthy than intended. Design goals meant to be traded off if necessary can easily slip into becoming non-negotiable requirements. Engineering margins have a way of building on each other, adding to all levels of the systems engineering and design process and multiplying the complexity tremendously. I worked one memorable urgent



The USSOCOM U-28A aircraft provides a manned fixed-wing, on-call/surge capability for Improved Tactical Airborne Intelligence, Surveillance and Reconnaissance (ISR) in support of Special Operations Forces. U.S. Air Force photo.

aviation program whose mission equipment requirements were growing uncontrollably from “good ideas.” Late in the manufacturing cycle, it was realized that every 10 pounds of weight was reducing on-station time by about 1 percent. We ended up stripping off all the nice-to-haves, got the system through production and deployed operationally. We then worked to prioritize and reincorporate a few of the highest-priority nice-to-haves.

Independent Operational Test and Evaluation (OT&E)—Do It Early and Often

Remember, actual combat/operational usage will always surface all the issues you didn’t fix first, and the consequences are always *bad*. OT&E uncovers real operational issues when it’s easy to fix them. Also, early OT&E lets the program manager get a fix on what’s important to the OT&E agency. Frequently that’s not obvious at the beginning of the program. Whenever possible when designing a program acquisition strategy, schedule in two full sets of OT&E before the production decision. That way if there are major issues from the first set, there will be time to fix them and retest. And if you get lucky and pass most or all of the tests the first time, you can cancel the second set of testing and accelerate the program.

Dress Rehearse OT&E During Developmental Test and Evaluation (DT&E)

During DT&E, it’s wise to “dress rehearse” for OT&E. In the 1980s, I was Commander, Operational Test and Evaluation Force’s (COMOPTEVFOR’s) operational test director for the Gas Management System. Naval Sea Systems Command (NAVSEA), after completion of its DT&E testing and

while certifying the system for OPEVAL, made a last-minute decision to run our OT&E plan as a final part of DT&E while the submarine was on patrol. That simple test uncovered what turned out to be a simple software error that had dramatic safety implications. Because the event occurred during DT&E instead of OT&E, NAVSEA was able to correct the problem. If it had been discovered during OT&E—or worse yet, after initial operational capability—the political dynamics of the resulting uproar would have likely caused cancellation of the entire program.

If It Ain’t Broke, Don’t Fix It

Don’t change something just because someone thinks it would be a good idea to change it. Change inevitably costs money. Even change to save money can end up costing more money. However, if that someone wanting the change is Chuck Yeager, this rule may not apply.

If It Breaks, Redesign It Against a Second Fix

Contrary to the common Department of Defense (DoD) doctrine, I have come to believe that good reliability is more important than good maintainability or good availability. If a system or part doesn’t break, you don’t need corrective maintenance personnel, a parts supply chain, maintenance training, repair manuals, etc. If you have a choice on where to invest limited sustainment funds, improving reliability generally is the best place.

Two Years After Initial Operating Capability, Operational Availability Will Dip

Many programs experience a surprising drop in operational availability two years after initial operating capability. The

root cause turns out to be the normal rotational process for military personnel. Key military operators and maintainers will get assigned to programs during their development, participating in design reviews, acting as operators during government testing, and becoming expert members of the systems' fleet introduction team/cadre. Finally, after a couple of years of successful operation, most or all of these experts will rotate out of the assignment, taking all

In a Program Management Office, Time is Money

The time a decision spends waiting in an in basket is just as expensive as time spent planning. Be aware of the cost of time. In a typical government research, development and acquisition setting, an engineer costs about \$220,000 a year, \$1,000 a day, \$120 per hour, \$2 per minute. For industry, wasted time comes right out of profit. For government, for every dollar devoted to a project, there's easily another dollar in overhead

It's always better to estimate on the high side and finish a program below cost and schedule as opposed to estimating low and finishing a program over cost or late or not finishing at all.



of their unwritten knowledge and experience with them. The apparent result noticeable at the program management office is a drop in operational availability, increased failure and increased repair times. The solution is to capture the unwritten expert knowledge from these departing key personnel as much as possible and increase training of new personnel.

Sponsors and Money

Can It Be Done?

If an old smart guy says it can be done, it can be done. If an old smart guy says it can't be done, and a young smart guy says it can be done, you may be able to do it. If you can't find a smart guy to say it can be done, it can't be done.

Coming up with new ideas is one of the easiest parts of solving a problem or attaining a goal. Figuring out a plan on achieving the goal, then executing the plan is the hardest part. Many ideas look great in concept but can't be executed because some of the basic building blocks aren't there. Sometimes good ideas are just ahead of their time. In the space race, it's important to remember that President Kennedy set our sights on the moon only after Sputnik, Russia's Yuri Gagarin and America's Alan Shepherd succeeded in taking the first steps.

Give the Customers Their Sticker Shock Early

If the customer can't deal with the cost, don't do the program. And a corollary: As a government PM, it's always better to estimate on the high side and finish a program below cost and schedule as opposed to estimating low and finishing a program over cost or late or not finishing at all.

costs elsewhere. Be aware of your costs and don't procrastinate unnecessarily. Multimonth delays in deciding the acceptability of a design feature on the critical path can cause program costs to spiral out of control.

In DoD, If You Spend Your Money Early and Get Recognized Value—They Give You More Money!

Over and over, we see programs fail because their managers acted miserly with their money, doling it out quarterly, hoarding it because it gave them power. However, starving a contractor or supporting agency for funds causes undesired actions. To minimize expenses, the contractor or agency will postpone hiring or assigning necessary staff and subcontractors. Talented staff will leave for better-funded projects. Eventually this will show up first as schedule slips and then as cost overages. It's wiser to spend your project's funds quickly and achieve recognizable milestones. Within a defense agency or Service, there's always some other program that is not spending its funds, so it becomes the "bill payer."

Conclusion

The Navy Department in 1986 issued a manual on "Best Practices" that called the defense acquisition process "The World's Most Complicated Technical Process." Since then it has only gotten more complicated. There are many pitfalls and traps along the way. I use the mountain climbing analogy a lot when describing defense research, development and acquisition. It took mankind 32 years, numerous false starts, and significant improvements in climbing gear to summit Mount Everest. So, as you're climbing your personal summit, I hope that these hard-won lessons will help you blaze a successful trail. &

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Application of the Integrated Product Support Elements

by the F-35 Joint Program Office

David Floyd ■ Monica Reyes

The Life Cycle Logistics community went through a major transition in April 2011 with the creation of the 12 Integrated Product Support (IPS) elements, outlined in the Department of Defense's *Product Support Manager (PSM) Guidebook*. This article aims to promote understanding of the IPS elements and to provide an update on their implementation across the Services by describing their innovative application in the F-35 Joint Strike Fighter Program. Before examining this implementation, however, let us consider the elements themselves.

The IPS Elements

The 12 IPS elements serve as a powerful enhancement and update to the traditional 10 Integrated Logistics Support (ILS) elements. Why was this done? As shown in Figure 1, the two additional elements, product support management and sustaining engineering, were added to reflect the PSM and life-cycle logistician's enhanced enterprise roles and responsibilities, which transcend the traditional logistics domain.

The PSM is a key leadership position for Acquisition Category I major defense acquisition programs. In order to identify and define the roles and activities in developing and implementing a viable product support strategy, the PSM needs to be able to interface effectively with senior leaders from other functional domains, including program management, contract management, business and financial management and systems engineering. Consequently, the product support management IPS element was created. This element provides the framework for the integration of the other 11 IPS elements, so the product support solution delivered to the warfighter is fully integrated and meets the warfighter's needs in terms of readiness, reliability and affordability.

Floyd, the Defense Acquisition University's performance learning director for life cycle management, is a certified professional logistician and Level III life cycle logistician. He is a retired Naval Reserve surface warfare officer with more than 30 years' logistics experience and is the principal author of DAU's Integrated Product Support (IPS) Element Guidebook. **Reyes** is a logistics management specialist for the F-35 Joint Program Office, global maintenance, repair, overhaul and upgrade capability. She has been with the F-35 JPO for two years and is the principal author of the RACI Matrix (responsible, accountable, consulted, informed matrix).



U.S. Air Force photo by Samuel King.

The sustaining engineering IPS element, a shared area of responsibility between the logistics and systems engineering communities, is the product support of in-service systems in their operational environment. It spans the technical tasks (engineering and logistics investigations and analyses) that ensure continued operation and maintenance of a system with managed (i.e., known) risk. This includes:

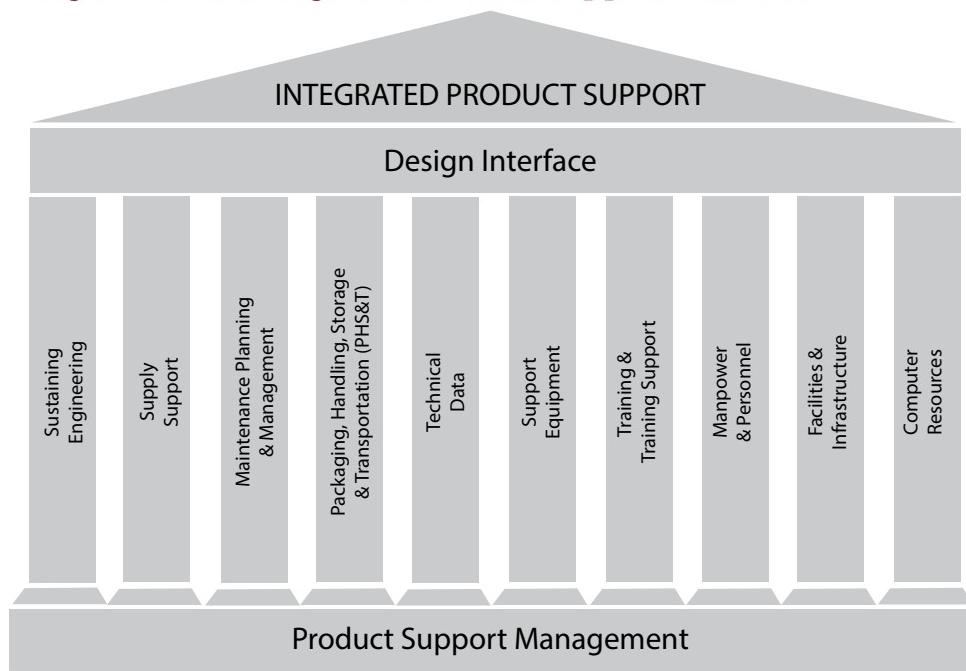
- Collection and triage of all Service use and maintenance data
- Analysis of safety hazards, failure causes and effects, reliability and maintainability trends, and operational usage profile changes
- Root cause analysis of in-service problems (including operational hazards, deficiency reports, parts obsolescence, corrosion effects and reliability degradation)
- Development of required design changes to resolve operational issues
- Other activities necessary to ensure cost-effective support to achieve peacetime and wartime readiness and performance requirements over a system's life cycle

Other modifications to the traditional 10 ILS elements include the following:

- "Maintenance planning" transitions to "maintenance planning and management," to incorporate maintenance management and execution activities along with the maintenance-planning activities.
- "Training and training equipment" becomes "training and training support," emphasizing the life-cycle focus of the training strategy and implementation.
- "Facilities" becomes "facilities and infrastructure," highlighting that facilities are more than simply "brick and mortar" buildings.
- "Computer resources support" changes to "computer resources," bringing this ILS element up to date by providing more focus on the information technology aspects of computer resources.

To facilitate implementation, execution and understanding of these 12 elements, the *IPS Element Guidebook*, fielded by the Defense Acquisition University in November 2011, provides detailed information about each of the 12 IPS elements and complements Appendix A of the *Product Support Manager Guidebook* by providing definitions for each IPS element and subelement. It also identifies key activities and products for

Figure 1. The Integrated Product Support Elements



each IPS element and provides a much-needed "how to" for these activities throughout the life cycle. The guidebook is an invaluable reference in helping the program manager (PM), PSM and life-cycle logistician answer the "what, how and when" questions of product support planning and execution.

The F-35 Joint Strike Fighter Program

The largest procurement program in the Department of Defense (DoD), the F-35 Lightning II, is a new, fifth-generation aircraft being procured in different versions for the U.S. Air Force, Marine Corps and Navy. Current DoD plans call for acquiring 2,443 of the F-35 aircraft. Hundreds of additional F-35s are expected to be purchased by several U.S. allies, eight of which are cost-sharing partners in the program. The F-35 promises significant advances in military capability, and it is critical to long-term recapitalization plans because it is intended to replace legacy fighter aircraft.

The F-35 Joint Program Office is developing and refining the product support strategy, along with the organizational roles and responsibilities. This involves the use of the RACI Matrix (otherwise known as Responsibility Matrix), a communication tool that defines the roles and responsibilities connected with various tasks by identifying the association between a particular task and an individual or organization. The letters R, A, C and I stand for responsible, accountable, consulted and informed, respectively. This tool typically is used in program management; however, it can be used for any type of project in which role and responsibility identifications are desired.

The RACI Matrix

The purpose of the RACI Matrix is to provide a comprehensive table for the F-35 Joint Program Office that will capture all essential logistics support and sustainment elements and

The F-35 promises significant advances in military capability, and it is critical to long-term recapitalization plans because it is intended to replace legacy fighter aircraft.

serve as a useful tool in identifying roles and responsibilities for each element.

The challenge in applying the IPS elements was that their structure did not capture all operational elements necessary to maintain and support capability. By using only the IPS elements, the RACI Matrix was limited to the PM's perspective. To be useful to all stakeholders, the IPS elements needed to be expanded to include the maintenance and operational functions.

In order to capture all necessary logistics and sustainment tasks to support the F-35 program, elements from the F-35 Sustainment Work Breakdown Structure, called the OneWBS, were incorporated into the IPS element structure to form the final task structure shown in Figure 2.

The integration of IPS elements and OneWBS elements resulted in specific areas being addressed that weren't covered by using only the IPS elements. This arose from the need for an even more detailed breakdown of subelements within each specific IPS element. The integration of the OneWBS elements, which function as the IPS subelements, provided the additional detail necessary to specify the assignment of roles and responsibilities for these tasks within the RACI Matrix. Examples of this expansion are as follows:

- IPS element 4 (supply support) was expanded to address two areas:
 - Unit-level supply support
 - Wholesale-level supply support/supply chain management
- IPS Element 5 (maintenance) was expanded to address three areas:
 - Product support planning associated with maintenance
 - Unit-level maintenance

- Depot-Level maintenance
- IPS element 9 (training) was expanded to address four areas:
 - Training planning and product development
 - Pilot training and qualification
 - Training operation, maintenance and delivery
 - Maintenance training

The tasks in the left column of Figure 2 consist of the IPS elements and subelements, along with the OneWBS additions, which number in the hundreds (because multiple OneWBS additions can appear under each IPS element or subelement). The top row identifies the organizations that support or participate in the F-35 Joint Program. These include the program executive office (PEO)/PM, PSM, product support integrator and product support provider organizations among others. Currently there are 55 organizations that have been assigned roles and responsibilities documented in the RACI Matrix.

In the cells of the matrix, a letter is placed to identify each organization's role or responsibility in connection with the elements, subelements and OneWBS elements. If an organization has no role or responsibility for a particular element,

Figure 2. RACI Matrix Task Structure

	Org	Org	Org	Org
IPS Element				
OneWBS element →				
IPS Element				
OneWBS element →				
IPS Element				
OneWBS element →				
IPS Element				
OneWBS element →				

then the cell is left blank. Each organization is identified as responsible, accountable, consulted or informed as described below:

- **R = Responsible.** These organizations perform the function and are responsible for action and implementation (the doers).
- **A = Accountable.** This is the organization ultimately accountable for the function.
- **C = Consulted.** These organizations must be consulted before a final decision or action is taken.
- **I = Informed.** These organizations must be informed of a decision or action.

Let us look at a partial example of role assignment in the matrix. For the "Establish and Maintain Product Support" task, the PSM (Director of Logistics and Sustainment) is identified as "accountable," the PEO/PM are identified as "informed," the Weapons Systems Logistics Management unit (under the PSM) is identified as "responsible," the Supply Chain Management unit (under the PSM) is identified as "consulted" and many other organizations and units receive one or another of these designations.

The benefits of applying the IPS elements structure to the RACI Matrix or other program applications include:

- Assigning responsibility and accountability to participating program organizations and integrated product teams for the implementation of the IPS elements and subelement activities

- Distinguishing between government and industry roles and responsibilities for the IPS elements and subelements
- Forming the basis for a common understanding and proper expectations as the product support solution evolves
- Serving to promote consistency and comprehensiveness in the application of the IPS elements across the life cycle
- Providing structure and flexibility in the tailoring of the IPS elements to a given program application
- Contributing to the overall understanding of IPS terminology, roles, responsibilities, processes, activities and associated products for each IPS element
- Improving IPS communications, resulting in better decision making

Summary

The transition from the traditional 10 ILS elements to the 12 IPS elements has gone smoothly as it is implemented across the Services. This can be seen in the application of the IPS elements in the RACI Matrix by the F-35 Joint Program Office. The RACI Matrix demonstrates a beneficial and relevant use of the IPS elements in identifying organizational roles and responsibilities, particularly for a large, complex program. It also shows how the IPS elements structure can be flexibly tailored to meet specific program needs. Finally, it validates the need for, and value of, the IPS elements, which are documented in the *DoD Product Support Manager Guidebook* and detailed in the *IPS Element Guidebook*.

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Your GPS for DoD Product Support

The *DoD Integrated Product Support Implementation Roadmap*

Mary Ryan



What if someone asked you to develop a major tool to help demystify Department of Defense (DoD) acquisition for product support? Suppose they also wanted it from a multiple military Service perspective that linked to integrated information on product support. Then let's say you also had to make it (whatever "it" might be) available online 24/7 for the Defense Acquisition Workforce (government and industry, about 500,000 strong). How would you do this? Where do you start? Whom do you call? Is this even possible?

This is exactly what happened as a result of the Weapon Systems Acquisition Reform Act of 2009 (WSARA). The Product Support Assessment Team (PSAT) requested the development of an online tool that would meet these requirements. The Defense Acquisition University (DAU) and the Services were asked to take on the challenge.

I was selected as the DAU lead to form and manage the team. You know you're going to need a small but powerful team when something is this challenging. In January 2011, the *DoD Integrated Product Support Implementation Roadmap* core team was formed with five members. This small but powerful and experienced team had representatives from the Army, Navy, Marine Corps and Air Force. We also had contractor support to help develop the tool in an electronic format. We started from the requirements provided to a concept, then a strategy, then development and implementation of the solution/tool. Subject matter experts were sometimes invited to join

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The DoD Integrated Product Support Implementation Roadmap is a performance learning tool designed to assist the Defense Acquisition Workforce plan, develop and implement effective and efficient product support strategies that deliver affordable readiness for our warfighter stakeholders.

and assist us when we addressed subject areas on which we lacked expertise.

I was invigorated by the challenge. Years ago as a working logistician in a Navy program office, I spent hours searching for information on policy, guidance, templates, tools, training or advice from more seasoned logisticians. Any resource that would help put together timely and high-quality support to the program manager (PM) was valuable. This project provided an opportunity to build a capability I had personally needed when working on a program.

Biweekly meetings quickly turned into weekly meetings. Initially, we thought we could break for lunch and return to work through the afternoon. We soon learned that "critical thinking and cooperation" of this nature required our best efforts for three to four intense hours of discussion and discovery, after which we adjourned for the day. Unlike the morning hours, the hours after lunch proved to be nonproductive. Brain drain was rampant in the afternoon. Eighteen months later on Oct. 1, 2012, after weeks of discussion and focused collaboration, the *DoD Integrated Product Support Implementation Roadmap* was released!

Our initial framework evolved around the 12 integrated product support (IPS) elements (<https://acc.dau.mil/ips-guidebook>) (previously the 10 integrated logistics support [ILS] elements). In order to analyze the elements across the total life cycle, we realized that each element needed to be broken into activities and outputs during each acquisition phase. As we began identifying activities and outputs, they became so numerous we decided we couldn't possibly identify and include all of them in layers of great detail. We needed to stay at a higher level. We also quickly learned that we could not build a process. Organizing a large amount of detail and trying to make a process flow out of it would create an almost unusable tool for the workforce. Our goal was to make a useful and understandable tool for the workforce, while at the same time creating the capability to link to additional in-depth information. Hopefully, it would enable them to gather the best and most current information so their program could be tailored to achieve the best results.

With the IPS elements, and the activities and outputs clearly identified across the acquisition phases, something still remained incomplete. After more "critical thinking and co-operation" on the team's part, we created two more major categories. With WSARA, the product support manager (PSM) was now a key leadership position (KLP) along with the program manager (PM). The PM had a major interest in the development and implementation of the product support package for the program. Product support management is a major contributor to a program's key events and products (such as milestone documentation, Analysis of Alternatives (AoA), Test and Evaluation Plan (TEMP), cost estimates, etc.). Product support planning feeds into milestone documentation, thereby enabling successful Defense Acquisition Board (DAB) reviews. Product support management also is a major contributor to logistics, programmatic and technical reviews over the life cycle. Thus were created the two categories of "Major Program Key Events/Products" and "Logistics, Programmatic and Technical Reviews" (across the acquisition phases).

On top of all these challenges, we had to conquer the semantics among the different Services and DoD. Some activities are called different things among the Services, and all Services don't have the same activities. Words became very important, and choosing the "right" lexicology (the study of the form and meaning of words) was challenging (i.e., Key Product Support Definitions).

The following are some of the specific things we first identified that shaped the product support *Roadmap*.

The primary users of the product support *Roadmap* would be:

- Product Support Managers (PSMs)



Before an Army Stryker engineer squad vehicle equipped with a mobile gun system is airdropped from a C-17 Globemaster III, product support planning and implementation have been ongoing since the Material Development Decision. The 12 IPS elements are accounted for from the material solution analysis phase through operations and support.

U.S. Air Force photo by Kevin Kidd.

- Life Cycle Logisticians (LCLs)
- Program Managers (PMs)
- System Engineers (SEs)
- Subject Matter Experts (SMEs)
- Government and Industry Acquisition Professionals
- DAU students—resident and online courses, continuous learning modules

The final design of the *Roadmap* incorporated three major areas. They are major program key events and products, logistics/programmatic/technical reviews, and the 12 IPS elements.

The *DoD Integrated Product Support Implementation Roadmap* online tool provides two views. The first view is a “list view” that shows a compact list of product support activities and at what acquisition phase they are required. The second view is a “timeline view” that shows activities and outputs over the total life cycle.

When you open either view, you will see many activities or outputs listed. Each item is connected to a meta card that provides links to additional information.

The meta cards provide links to Office of the Secretary of Defense policy/guidance such as DoD Instruction 5000.02, the *Defense Acquisition Guidebook* (*DAG*) and various guidebooks. Other links to applicable references or tools are the *Integrated Product Support Element Guidebook*, ACQuipedia Articles, *DAU Glossary*, Milestone Documentation Identification; other functional area tools such as the Systems Engineering Review Technical Slider, Systems Engineering Technical Review Timing, links to DAU training and, finally, Service-specific links. All these links can be accessed from the Defense Acquisition Portal (DAP) smart page at <https://dap.dau.mil/smart/>.

The feedback button on each meta card is very important. This is your opportunity to provide updated or new input to the team. The *Roadmap* includes more than 2,800 data items. Sustainment is a challenge. Therefore, we value feedback from SMEs and the Services to help provide the most current information to the workforce.

Examples of links to other functional areas on the product support *Roadmap* demonstrate the importance of integration among the functional areas:

- Better Buying Power (BBP) Gateway (<http://bbp.dau.mil/>)
- Department of Defense Source Selection Procedures (DoD SSP) (<https://acc.dau.mil/dodssp>)
- Comparison of Major Contract Types—2014 (<https://acc.dau.mil/contract-types-card>)
- DAG Chapter 10.2.1 Defense Acquisition Board (DAB) (<https://acc.dau.mil/CommunityBrowser.aspx?id=518695>)
- Milestone Document Identification (<https://dap.dau.mil/mdid>)
- Test and Evaluation Management Guide (<https://acc.dau.mil/temg>)
- Systems Engineering Technical Review Timing Tool (https://acc.dau.mil/docs/technicalreviews/dod_tech_reviews.htm)
- Systems Engineering Technical Review Slider (<https://acc.dau.mil/docs/technicalslder/slider.html>)
- *Acquiring and Enforcing the Government’s Rights in Technical Data and Computer Software Under Department of Defense Contracts: A Practical Handbook for Acquisition Professionals* (<https://acc.dau.mil/CommunityBrowser.aspx?id=431675>)

The following scenarios provide examples of how the DoD Product Support *Roadmap* can deliver important information and guidance.

You are the PM on an ACAT (Acquisition Category) I program. You need information on what exactly the PSM is responsible for and when to expect it. The *Roadmap* provides a List View of the 12 IPS, major program key events/products and logistics/

A small-diameter bomb hits its target. The SDB is a 250-pound class munition providing the warfighter with a fourfold increase in weapons per aircraft station. The bombs are delivered in single, reusable aluminum weapon containers or loaded on a miniature munitions carriage. Supportability testing is a critical part of product support planning and implementation. U.S. Air Force photo.



programmatic/technical reviews. The Time Line view provides activities and outputs from all of these areas in an acquisition phase related perspective. This provides the PM with an understanding of what is required in the concept, development and implementation planning for product support on the program, when to develop and execute it and how the PSM supports the program. The PSM is responsible for providing inputs to all the technical reviews, requests for proposals and statements of work, the integrated master schedule, the Product Support Business Case Analysis (for contracts and funding requirements), etc. The *Roadmap* provides integrated information across all functional areas, not just Logistics.

* * *

You are a new life cycle logistician. The PSM you work for has asked you to attend an Independent Logistics Assessment (ILA). You aren't sure of what happens at an ILA or how to prepare. The *Roadmap* provides you information on ILAs. Look at the time line view under Logistics/Program/Technical reviews. Click on ILA and it will provide a meta card with definition, ACQuipedia article, guidebook references, Service-specific references, policy, communities, training and other resources—everything you need to know about an ILA, all in one place.

* * *

You are a systems engineer looking for specific information on Supportability Analysis and other engineering-related topics over the total life cycle. Search the *Roadmap* (ctrl F) and find information in both the List View and Time Line View that is pertinent to what you are looking for in the maintenance planning, supply support, design interface, sustaining engineering, training and training support, manpower and personnel, technical data, support equipment, computer resources, packaging, handling, storage and transportation, and facilities and infrastructure. There is abundant information for systems engineers on the *Roadmap*. This also includes all the technical reviews, information on engineering change

proposals, configuration management, causal factors, failure mode, effects and criticality analysis (FMECA), etc.

* * *

You are a logistian on an ACAT III program. You are unfamiliar with activities in sustaining engineering during the Operations and Support phase. You can find specific information on both the List View and Time Line View (activities and outputs) regarding this specific product support element and acquisition phase from the *Roadmap*. You would also want to review the design interface IPS element along with sustaining engineering.

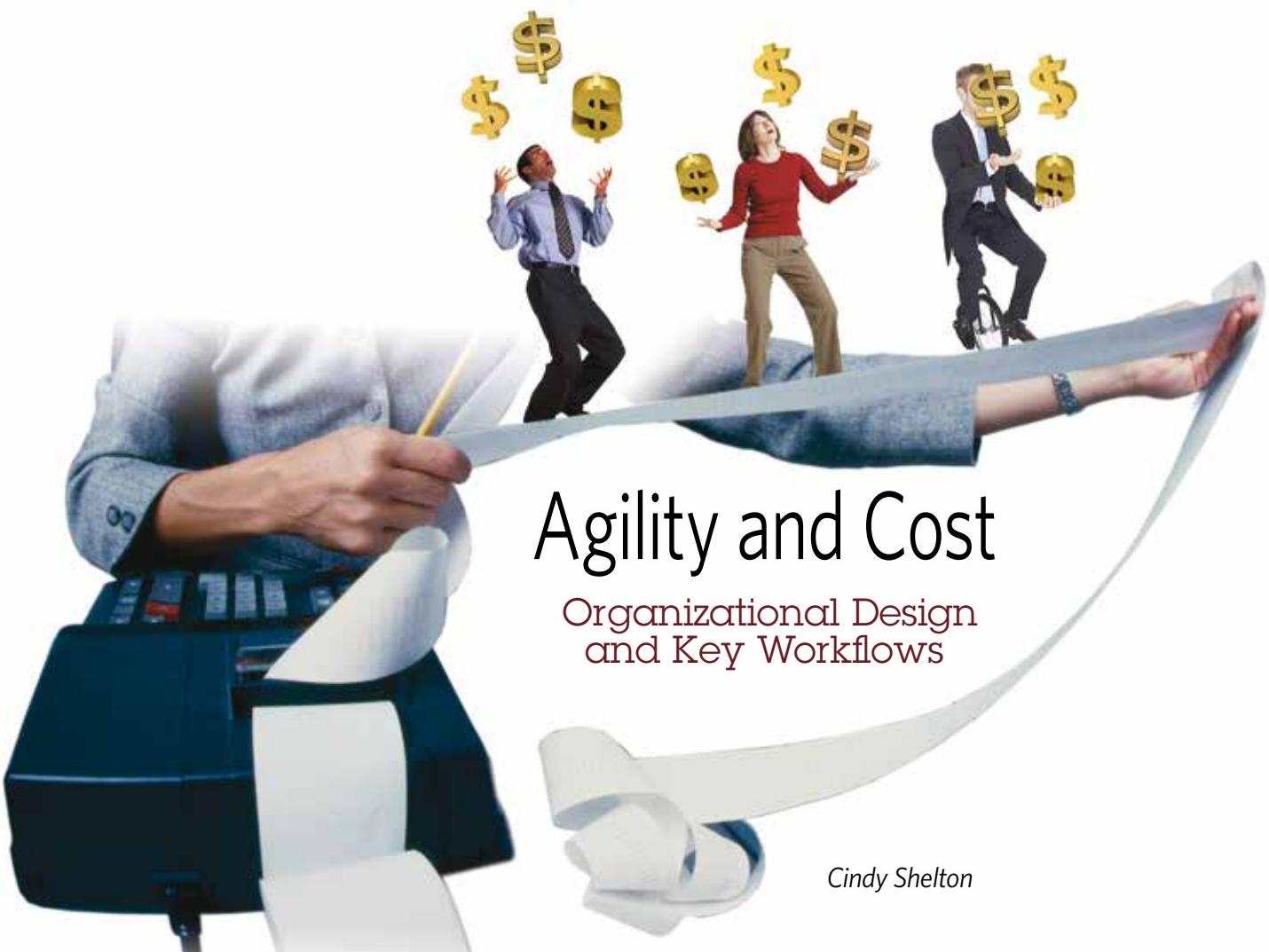
* * *

You are a new life cycle logistician on a program that just achieved its Milestone C. The PSM you support has asked you to provide updates to the Life Cycle Sustainment Plan (LCSP) for maintenance during the Production and Deployment (PD) phase. You need more detailed information on the LCSP and also maintenance planning during PD. The *Roadmap* will provide you specific information about Maintenance Planning during the PD phase. You can use both the List View and the Time Line View.

* * *

DoD acquisition is complex! But with a good roadmap, the ability to think critically about your specific program and a small, powerful and experienced team, you will get there from here. I guarantee that the journey will be challenging, complicated and complex, but it will also be worthwhile, fulfilling and rewarding to know you have done your best to support our warfighting community and defend our freedom. &

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Agility and Cost

Organizational Design and Key Workflows

Cindy Shelton

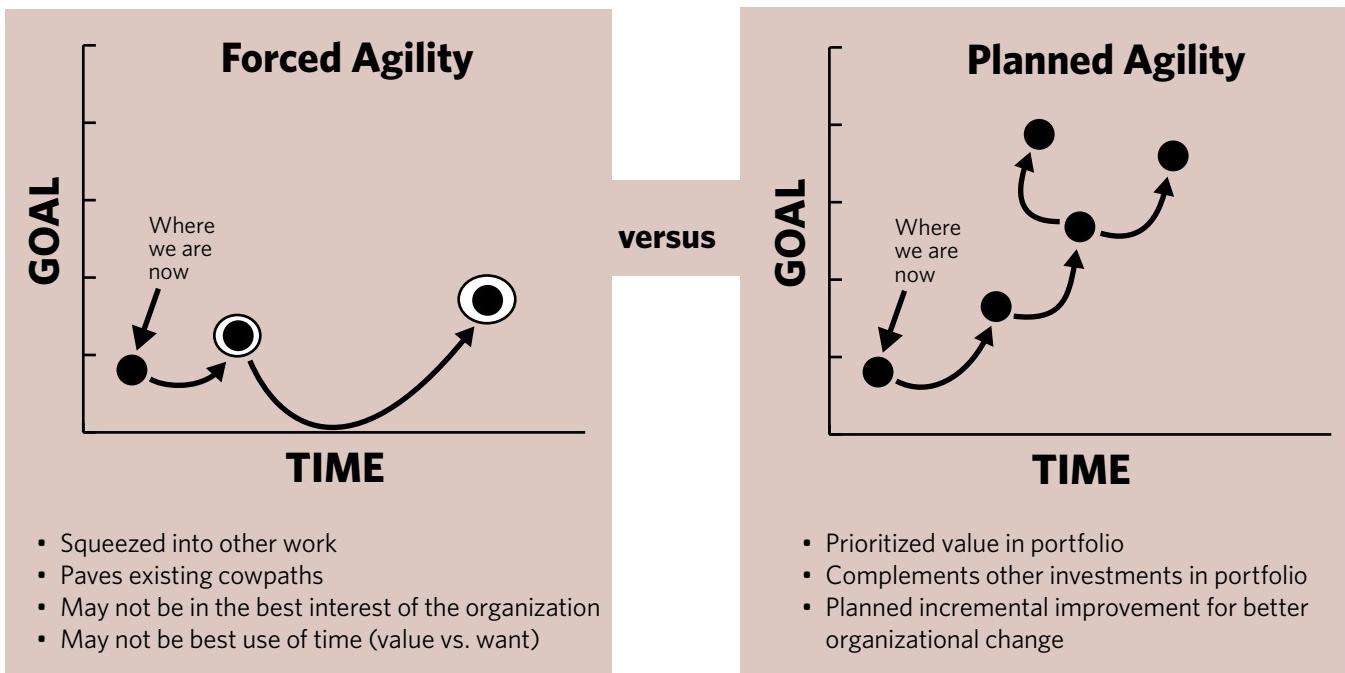
O rganizational agility—the ability to react quickly to changing market circumstances—is a critical necessity for effective government operations if we are to respond to the ebb and flow of political issues. Many managers apply creativity to adjust and adapt (and force agility) so this unforeseen work and their own pet projects can be executed.

While admirable, forcing agility often becomes a new paved cowpath, involving much unplanned work and eventually resulting in functional redundancy and inefficient workflow. Ironically, lean processes are inflexible by nature and must be adjusted over time; this makes their application at the organization almost a non-lean practice in itself.

When the amount of change grows too large, the entire organization becomes inefficient, and it takes significant effort (and money) to recalibrate the organization. Large organizations cannot stop operating to adapt and adjust their infrastructures to the rapidly changing demands of business, so they continue to evolve into newer levels of inefficiency. Their defined business processes, structures and systems ironically now act as barriers to efficiency and common-sense decision making. These internal barriers can also trap capable people, who eventually become

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Figure 1. Forced Agility Versus Planned Agility



cynical and disheartened due to their inability to change or influence obvious gaps, inconsistencies or burdensome constraints within the organization.

The organization is trapped. Projects, consultants, frameworks and models are sincerely applied, but this rarely results in the anticipated return on investment. There is a better way.

Planned Agility

Rather than throw money at the problem, consider using internal resources to do the work (instead of consultants) and implementing work practices that improve the visibility of the work being accomplished so it may be more easily valued against other work. Then, with a holistic view, adjust your portfolio with increments of work that can be executed iteratively within existing portfolio elements or as new portfolio elements. This approach avoids the need for an organizational redesign project. In this manner, the organizational redesign work can be integrated into current work using people who know the organization best, and management can prioritize and justify the work based on value rather than the perception of political influence.

Start With Your Portfolio

Most organizations have implemented portfolio identification and management practices, making them the perfect starting places since they portray the optimal state, not the status quo, as the first step in qualifying and quantifying the work undercurrents. Optimally, portfolio contents are not bound to current practices that may be ineffective or inefficient. Your end-state portfolio should identify all work that distracts workers from their core mission: systems, studies,

business process re-engineering, analysis, operations, etc. Don't worry if it doesn't. The work done here will fill it out with more context, leading to a complete portfolio of work needed in the organization.

Using the portfolio you have, identify known overlapping responsibilities and inefficient workflows within that portfolio, then answer the following questions and capture those items:

- What can we do to become more efficient in our operations and drive down overhead costs?
- How can we get our cross-functional operations working more effectively and efficiently?
- How can we increase the speed and quality of our decision making?
- How can we significantly and successfully scale while maintaining appropriate efficiency ratios?
- What can we do to get our people executing more effectively?
- How do we implement significant change and maintain or increase productivity, reduce overhead and maintain staff morale and dedication?
- How do we increase the time to market and reduce the acquisition life cycle for new products?
- What is the most effective balance of centralized and decentralized operations?
- What is an effective model to generate new ideas and efforts?

The expanded list of items will contain common themes and regulatory requirements as well as those that are interesting but do not support critical thinking or decision making.

Several studies have proven that “interesting” indicators top the icebergs of inefficient operations when an organization has forced agility. A note of caution: Regardless of efficiency, metrics and measures exist that do not provide value to you but are still mandated. While these may present your organization with an opportunity for change, political pressures may not allow changes to be made quickly. Apply common sense where it isn’t common and let them be.

The expanded list just created contains ineffective workflows and structures or systems to be redesigned and implemented. Later on this list is weighted and prioritized in the other work on the portfolio and implemented incrementally. The incremental approach based upon value limits organizational shock—aka resistance to change—because the changes are smaller.

Operational Design and Workflow Analysis

The design model involves a central design team, chartered by senior management. In this model, fewer employees from a cross-section of the organization analyze, redesign and develop implementation plans that they present to senior leadership and the rest of the organization for approval and adjustment. The advantage of this model is that the design team creates continuity throughout the process and can drill deeper in some of the analysis, design and planning tasks. The

work is fundamental to the organizational design and difficult to change later. This “technical risk” must be balanced against the perceived value to the organization, and the highest-risk items must be done first. Therefore, contrary to some organizational guidance, in this instance we select the most difficult tasks sooner rather than later to allow the impact to the organization to be spread over a longer time, which also allows it to be funded incrementally over multiple years.

A hidden advantage is that working on the highest-risk items first distributes the risk over a longer period, more closely aligning to the perceived cycles of meaningful change in an organization’s environment. Therefore, addressing the more problematic issues first is better for the organization than implementing the easiest and cheapest items first.

The intent is to plan the project iteratively to gain the greatest organizational value while allowing for flexibility and changes since the organization is fluid and new work and ideas will naturally continue emerging.

To prevent rework and churn, work in progress cannot be changed—however, the work of any other iterations (or blocks of work) can be reprioritized by the executive sponsor or new items can be added. Before the start of each iteration,



Several studies have proven that “interesting” indicators top the icebergs of inefficient operations when an organization has forced agility.

design team model also fosters commitment and ownership throughout the organization, allows iterative work and organization change but requires more ongoing communication to the rest of the organization.

Planning for this “project” is no different from other project planning practices and involves identifying the stakeholders, governance model, resources and constraints (risks) in the same manner. The length of the cycle to make meaningful changes and the need for funds to enable them constrain organizational change. It is easy to fall into the trap of overspending to start something that might provide immediate but no long-term meaningful value, especially when funds are unavailable. Quick wins rarely sustain strategic change.

Strategic planning cycles constrain organizational change. These cycles are much longer than one year, and decisions made up front may not be changed feasibly later due to the political capital involved. Often the most difficult and costly

the portfolio/schedule is revalidated with the team and the sponsor for new information.

At each iteration’s start, the team documents all the work it is assigned outside the project. This is to document “distracters” and provide visibility into the work for executive leadership. All distracters are documented on the organization map. During each iteration, team members from that organization or particular work flow participate in the analysis and design sessions to develop a comprehensive set of recommendations for the larger or “macro” organization, aligning that set with current strategies and business demands. The team members outline the “ideal organization”—and their place in it—identifying ideal processes, structures and systems for the whole organization. Each area will be iterated through until a logical organization emerges. Maintaining determined focus on the themes, the team creates a design that integrates the people and resources around activities critical to organization success. The participants also will

identify all transition and implementation activities (such as policy changes, employee communication, leadership training or staffing changes) necessary to implement the new design throughout the organization. The team also will identify implementation tasks such as tracking and measurement of the new design. Identifying these tasks and estimating the work creates the overall value and risk profile for each increment. These increments are updated on the master work schedule for reprioritization by the executive sponsor.

After identifying transition and implementation activities, participants sequence these on a master implementation timeline. For each iteration, the team outlines action plans, including what is to be accomplished, who is responsible for getting it done and when it will be in place. The timeline and action plans provide a concrete guide for implementing the new design throughout the organization. Instead of being left to chance, implementation of the new design iteratively becomes a well-orchestrated, planned and executed project. The master plan is detailed just enough to understand areas of integration and constraint. All detailed planning is done closer to execution when estimates are more accurate.

A helpful tip is to make sure the work takes no more than 25 percent of a design team member's time. The design team member would be led by three rotating full-time equivalents: Working Sponsor, Project Manager, and Analyst.

The following work packages and associated tools and techniques can be used to jump start the initiative. The output of these work packages is a complete portfolio of work that provides visibility to all the work to be done in the organization. Such a portfolio of valued and prioritized items encourages rational discussions on the placement of each item to the betterment of the organization.

Leverage Organization Process Assets Package

Start with what you know now by leveraging previous projects and research as shown in this box:

Package Project Information

- Wall to Wall Studies—map detail into functional map
- Previous Organizational Studies such as 5x5—map detail work into functional map
- Consolidate CORE (Capabilities, Objectives, Resources, Evaluative Methods), Strategy, and Requirements Planning
- Existing Organization Map and Resources with Overlaps

Resources: Work Team

Governance: Represented executive from each area under analysis: i.e., one hour a week

Estimate Time to Complete: i.e., one month

Validation: Executive weekly review of content

Deliverable: Knowledge of historical and current environment

Just Enough Analysis Package

Using prioritization techniques, organize the analysis to be done. Analyze core work processes and workflows at more levels and in more detail. In-depth process analysis starts where the larger assessment process leaves off, identifying and analyzing processes that need to be understood and mapped in more detail before conscious and accurate design decisions can be made regarding them. All mapping and designing will use visual indicators and charts publicly for transparency, ease of use and osmosis involvement. If other systems or structures need to be better understood, they may also be analyzed in more depth before moving to redesign decisions. Opportunities for improvement are better quantified and the design project can now be planned and implemented in depth.

Package Project Information

Resources: Core Team

Governance: Each Executive: i.e., one hour a week

Estimate Time to Complete: i.e., two months

Validation: Brief work plan to responsible official

Deliverable: Prioritized Master Work List

Iteration Work Package

The team and the executive sponsor will develop the master schedule consisting of blocks of work, or "iterations." Working from an initially prioritized list of "investments [in time]" managed by an executive sponsor, the team will take the highest-priority work and analyze, design and implement the change iteratively from a master schedule. Each increment may be delivered in one iteration, grouped with other increments for iteration or a combination.

Package Project Information

Resources: Core Team plus members from organization or workflow addressed

Governance: Each executive: two hours a week

Estimate Time to Complete: Rhythm to be set at planning

Validation: Executive weekly review and initial of visual indicators

Deliverable: Defined objective of that work list item from the portfolio

Analysis Tools and Techniques Employed

The purpose is to create working environments that take into account current strategic capabilities, shortfalls and redundancies to eliminate isolated, independent stovepiped planning while following foundational principles.

Describe requirements in terms of strategic capabilities by replacing statements such as "we need shared services" with "we have a strategic capability redundancy in that three departments perform the same function" or "we have identified four non-value-added steps in the process for creating a procurement package for Human Capital Systems."

Derive needs from a top-executive, cross-departmental and multidimensional perspective using more than one “technique or tool.” One tool: Use CORE: What needs to be done (Capabilities)? How well (Objective measures)? With what (Resources)? How will we know it is being done or how well the goal was met (Evaluative methods)? Who is best to do each step, where is it done, how will we know it is being done, and with what? How will we know it is being done or how well the goal was met? CORE analysis is designed to challenge existing approaches and provide impetus for improvement. Another tool: Apply mind maps or the “five why” technique after the first tool is used. The intent is to flesh out additional information and justification. There may be a valid and cost-worthy reason for redundancy.

Top Down Analysis

Distill studies, strategic plan, organization chart and executive interviews to determine primary functions. Separate primary duties from analysis, special projects, additional duties, etc., and create a function chart that groups similar functions. Where there is overlap, do a deeper dive using techniques to determine variances and the cost profile. Conduct select “day in the life of” or workload capacity analysis that considers the Hawthorne effect, in which changes in the work environment (such as being studied) spark alterations in workers’ behavior.

Validate with executive staff in weekly meetings. Where a capability gap exists, determine the outside capability, then analyze and make recommendations.

Root Cause Analysis

Next, validate any audits and analyses to date and conduct Root Cause analysis for actions that are incomplete, reported inaccurately or accomplished multiple times.

Key Performance Indicator Validation

Using information provided to external organizations only (such as Government Accountability Office [GAO]) on progress, metrics or issues, validate each against actual criteria. For example, the Department of Homeland Security Human Capital Management had seven GAO outcomes identified in 2011. None of these was fully addressed, three were mostly addressed and four were partially addressed.

Value Mapping

Mind map the capabilities and requirements and compare to the derived Functionality Map. Identify the total cost of flow, and the cost of delay or waste.

Kanban

All work planning design and implementation will use Kanban (from the Japanese for “signboard”) concepts of lean work management that will be taught to the core team.

Visualize, manage workflow. Knowledge work is inherently invisible. Visualizing the flow of work and making it visible is

central to understanding how work proceeds. If the workflow is not understood, it is harder to make the right changes. A common way to visualize the workflow involves using a wall with cards and columns. The columns on the card wall represent the different states or steps in the workflow.

This implies that a “pull” system is implemented on parts or all of the workflow. The pull system will provide one of the main stimuli for continuous, incremental and evolutionary changes. The critical elements are that work in progress (WIP) at each state in the workflow is limited and that new work is “pulled” into the new information discovery activity when there is available capacity within the local WIP limit.

Work flow should be monitored, measured and reported. Actively managing the flow allows evaluation of the continuous, incremental and evolutionary system changes for positive or negative effects on the system.

Have explicit policies. Until the process mechanism is made explicit, it often is hard or impossible to discuss improving it. Without an explicit understanding of how things work and how work is done, any discussion of problems tends to be emotional, anecdotal and subjective. With an explicit understanding, it is possible to move to a more rational, empirical, objective discussion of issues. This is more likely to facilitate consensus around improvement suggestions.

Implement feedback loops. To enable evolutionary change, collaboration is vital in reviewing the flow of work and demand versus capability measures, metrics and indicators—and this must be coupled with anecdotal narrative explaining notable events. Organizations that have not implemented the second level of feedback—the operations review—generally have not seen process improvements beyond a localized team level. As a result, they have not realized the full benefits of Kanban observed elsewhere.

Improve collaboratively, evolve experimentally. Kanban encourages small continuous, incremental and evolutionary changes that stick. When teams have a shared understanding of theories about work, workflow, process and risk, they are more likely to be able to build a shared comprehension of a problem and suggest improvements that can be agreed upon by consensus. The Kanban method suggests that a scientific approach is used to implement continuous, incremental and evolutionary changes. But Kanban does not prescribe a specific scientific approach.

Summary

Organizational change is expensive but necessary. Using resources that know your organization, and decomposing the work into smaller prioritized packages, can achieve success where no other success is possible. In addition, the organization is strengthened by the visibility and growth of knowledge in its operations.

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Defense AT&L

Writers' Guidelines in Brief

Purpose

Defense AT&L is a bimonthly magazine published by DAU Press, Defense Acquisition University, for senior military personnel, civilians, defense contractors, and defense industry professionals in program management and the acquisition, technology, and logistics workforce.

Submission Procedures

Submit articles by e-mail to datl@dau.mil. Submissions must include each author's name, mailing address, office phone number, e-mail address, and brief biographical statement. Each must also be accompanied by a copyright release.

Receipt of your submission will be acknowledged in 5 working days. You will be notified of our publication decision in 2 to 3 weeks. All decisions are final.

Deadlines

Note: If the magazine fills up before the author deadline, submissions are considered for the following issue.

Issue	Author Deadline
January–February	1 October
March–April	1 December
May–June	1 February
July–August	1 April
September–October	1 June
November–December	1 August

Audience

Defense AT&L readers are mainly acquisition professionals serving in career positions covered by the Defense Acquisition Workforce Improvement Act (DAWIA) or industry equivalent.

Style

Defense AT&L prints feature stories focusing on real people and events. The magazine seeks articles that reflect author experiences in and thoughts about acquisition rather than pages of researched information. Articles should discuss the individual's experience with problems and solutions in acquisition, contracting, logistics, or program management, or with emerging trends.

The magazine does not print academic papers; fact sheets; technical papers; white papers; or articles with footnotes, endnotes, or references. Manuscripts meeting any of those criteria are more suitable for DAU's journal, *Defense Acquisition Research Journal (ARJ)*.

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Length

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Format

Send submissions via e-mail as Microsoft Word attachments.

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